Rhetoric versus Realities

A diagnosis of rainwater management development processes in the Blue Nile Basin of Ethiopia

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Executive Summary

Smallholder rain-fed farming is the backbone of the Ethiopian agriculture sector, the dominant contributor to national GDP and at the heart of the country’s current national growth strategy. Considerable potential exists for enhancing food production through better rainwater management (RWM). Ethiopia has invested extensively in RWM interventions, in particular soil and water conservation and afforestation, over the last 40 years, but in many areas with disappointing impact, for multiple reasons. Given limited success with previous approaches towards natural resource conservation, a new approach is obviously needed, but what should it be? This question is at the centre of the Nile Basin Development Challenge (NBDC) project, part of the larger “Challenge Programme on Water and Food”. The two key elements of the NBDC approach are (1) viewing RWM as a landscape-scale issue, whereby watersheds are conceived as socio-agro-ecological systems with social, economic and institutional networks that may cross-cut hydrological boundaries; and (2) recognising that improving RWM successfully, and on a sustainable basis, requires a focus on institutions as well as technologies, and a new approach to planning, implementation and monitoring of interventions.

The Nile 2 project (N2), *“On integrated RWM strategies – technologies, institutions and policies”*, is centred on field research in three pilot learning sites. The starting point for research in N2 is that integrated RWM strategies need to combine technologies/practices, policies and institutions, and need to be developed through innovative approaches which bring together different stakeholders. Because policies and institutions can foster or discourage the adoption of productivity-increasing, resource-conserving strategies by farmers, the project also examines the extent to which policy change and institutional strengthening and reform could be combined with new technologies to spur widespread innovation.

A central mechanism for stimulating innovation within the NBDC is the use of innovation platforms at district and national level. The current diagnosis was in part designed to inform the development of innovation platforms by providing a baseline understanding of existing RWM strategies and institutional arrangements at local level. There are various elements to this. First, we were interested in how RWM interventions are planned and implemented at local level, and how different actors are involved in this process. Second, as planning and implementation processes are heavily influenced by government at all levels, we were interested in what this dominance means for local “innovation capacity”. Finally we wanted to understand the diversity of local livelihood strategies and how these might intersect with formal and informal approaches to RWM in our study sites.

Three woredas in the Nile Basin of Ethiopia were selected for intensive study as part of the larger project. These are Jeldu and Diga in Oromiya Regional State and Fogera in Amhara Regional State.

Ethiopia is often cited as an example of severe natural resource degradation. As a country reliant on an agricultural sector dominated by smallholder farming, land degradation presents a major challenge in terms of agricultural productivity, food security and rural livelihoods. Various land and water management programs have been implemented on farms and community lands over the past four decades, undertaken by government agencies in collaboration with national and international organizations. However, success to date has been limited. A short review of past interventions, policy and politics is presented in order to gain an understanding of the current policy situation.

The rationale for focusing on planning and implementation of RWM was that at the outset of the project it was recognised that a number of national and regional policies and strategies in relation to RWM existed, including very detailed guidelines, for example for participatory community watershed management, but that planners, in particular at lower administrative levels, did not have sufficient tools and skills available to engage at a landscape level for effective integrated and multi-sectoral planning and implementation of RWM. In sum, one of the hypotheses that guided this research was that there existed a gap between available policy and guidelines and specific implementation. As well as characterizing the planning process, the baseline assessed its effectiveness in terms of the extent to which RWM planning is evidence-based, tailored to social and ecological niches, cross-sectoral, and participatory. Opportunities and barriers to strengthen RWM processes were then identified. In terms of RWM, two different levels of planning and implementation have to be distinguished. Firstly, those interventions which are being carried out by farmers themselves on their own land, for which no kebele-wide plans exist but which farmers do out of their own initiative as part of their ongoing cropping practices. Secondly, RWM interventions at larger scale such as watershed protection, for which collective action is needed and for which more planning and coordination is required. It is with regard to these latter plans where farmers feel that the practice and theory of planning are quite different and where it seems that the planning process is dominated by a top-down approach and local realities are not well reflected. This is largely the result of targets defined at national level for the period 2011 to 2015 as part of the Growth and Transformation Plan. A number of issues were identified that need to be addressed if improving RWM is to become an integral part of sustainable agricultural development. These relate to the discrepancy between policy and practice, the notion of participation, the role of and incentives for DAs, a failure to anticipate conflicting interests and missed opportunities to tap into local knowledge that could enhance sustainability of interventions. Overall our research has identified a key dilemma in relation to planning that need to be resolved if RWM interventions are to be owned by farmers, show sustainability, and make a meaningful contribution to improved environmental management and better livelihoods: National plan, output targets and a generally top-down planning focus versus devolution, decentralisation and participation of planning and co-development of innovations at lowest possible level.

As in the case of planning, a range of different actors is involved in implementing RWM practices. Our research focused primarily on those community-wide interventions which require larger investments, coordination across a watershed and more technical know-how, and which are implemented by farmers in the form of NRM campaigns under close supervision of DAs and with technical inputs from woreda experts. A key issue mentioned was that many of the RWM and NRM implementation activities are carried out as one-off campaigns to achieve targets without due attention to the future maintenance and sustainability of interventions.

A variety of RWM interventions have a long tradition in the study sites, particularly those implemented by farmers on their own land, alongside normal cropping and farm management practices and involving little or no costs. Other interventions which are more labour and cost-intensive and need coordination across several farms or a watershed are much less likely to be sustainable. There are a number of reasons for the poor sustainability of these interventions, among them lack of relevance to local priorities, weakness in technical design, lack of voluntary collective action, lack of clear governance arrangements for interventions on communal land, poor follow-up and monitoring and a focus on isolated technical interventions.

Despite several decades of intensive investments in RWM and natural resource management across Ethiopia, the impact on livelihoods and natural resources quality and quantity in many areas is rather disappointing. This should not distract, however, from the numerous sites across the Ethiopian Highlands where RWM and natural resource management has been more successful and is reported to have led to increasing household wellbeing, increasing community resilience and improved availability of a variety of natural resources. Many land and water management technologies and approaches are not achieving their full impact, mainly because of low levels of ownership and sustainability, but also because where degradation of natural resources is less advanced, benefits of natural resource conservation are more difficult to detect. Approaches to NRM and RWM have historically been technology-oriented and top-down in approach without much regard for the needs, aspirations, constraints and livelihood realities faced by farming communities. In addition, many of the RWM investments were seen as an end in themselves rather than a means to achieve improved household wellbeing and increased community resilience. It is of critical importance that RWM strategies adopt a people-centred approach which takes into account local livelihood strategies and constraints, cultural, social and institutional dynamics as well as power relations and gender issues. It is essential to gain an understanding of these aspects because they feed into development planning for sustainable land use and livelihoods. Farmers’ livelihood strategies shape their ability and desire to adopt different land-use practices. Therefore, an adequate understanding of these strategies is critical for appropriate targeting of interventions.

Our research has highlighted various livelihood issues which need to be considered if RWM activities are to be successful. Key among these is active involvement of community members in the process of RWM activities right from the start. Development agendas and interventions introduced by outsiders may conflict with local knowledge and priorities which address specific needs and circumstances. Better understanding of current knowledge and practices, coping mechanisms, capacity for innovation and mechanisms for community mobilisation, as well as understanding the reasons for resistance to certain interventions, could lead to a much better understand of how, where and what to promote when it comes to RWM. There are potentially exciting opportunities for co-development of plans and interventions which incorporate local perspectives as well as develop farmers’ capacity to innovate. Care must be taken not to idealize indigenous knowledge, but multi-stakeholder participatory processes involving external agents and community members can be used to assist local communities to organize and assess their own knowledge and resources whilst also identifying and integrating appropriate outsider knowledge and technologies. It will be important to develop mechanisms for collaboration between various stakeholders which enable different knowledge and perspectives to be exchanged, shared and translated into action.

Our findings on planning and implementation processes indicated that a strongly linear development paradigm still dominates Ethiopian development thinking about RWM. More recent thinking on the application of innovation systems thinking to RWM development appears largely absent. There are some fairly entrenched issues which are limiting innovation at local level. Chief among these would seem to be the system of quotas for RWM activities and the top-down approach inherent in planning and implementation to meet quota targets. There have certainly been moves to introduce more participatory approaches to RWM in recent years but “old habits die hard” and the evidence from our research suggests that often participatory planning and implementation of RWM interventions is participatory in name only. An equally important issue concerns prevailing understanding of how innovation happens. Evidence from our research suggests that a strongly linear paradigm still dominates thinking on rural innovation in Ethiopia. We would argue that more recent thinking on innovation networks that acknowledges the need for a wider array of actors and more opportunity for multi-directional feedback and experimentation has much to offer in enhancing innovation capacity at local level. In practical terms this could mean experimenting with the use of local innovation platforms to provide a space for relevant actors jointly identify constraints and solutions to NRM issues at local level.

This baseline study has revealed a number of reasons why current RWM strategies are not as effective as they could be. National targets for improved RWM indicate that priority is attached to reducing natural resource degradation and its damaging effects on livelihoods and food security by government. This could be a force to help drive local action. However, targets are currently allocated down to kebeles with little attention to the suitability of each strategy for local agro-ecological conditions or their relevance to local livelihoods. This results in a lack of ownership by both farmers, who are ultimately responsible for implementing plans, and DAs who feel they have no influence over plans in spite of their local knowledge and despite being responsible for a notional bottom-up planning process. There are good reasons why experts from the Ministry of Agriculture decide that specific RWM interventions are necessary, reasons which might not be immediately apparent to farmers. Insufficient communication and provision of explanations for such decisions contribute to a lack of buy-in and acceptance by farmers. It is therefore common for RWM interventions to be poorly implemented and maintained, or even destroyed, and for them to contribute little to improving local livelihoods. This lack of sustainability is also related to the way in which DA performance targets are set (these focus on implementation targets, not outcomes or longevity of interventions) and to the absence of effective governance arrangements for managing NRM on common lands.

As well as resulting in poor progress in terms of tackling natural resource degradation and improving land and water productivity, the current approach misses opportunities to support, and build on, local capacity for innovation. The entrenched mind-set is that farmers lack awareness, have little knowledge to contribute, and must receive expert technical instruction from above. There is, of course, a place for external technical expertise, and research into new technologies by, for example, agricultural research centres. However these need to be married with farmer knowledge and experience in a freer, and more equal, exchange of ideas if real innovations are to emerge which can solve problems at local level.

A range of recommendations have been drawn from this baseline study that could represent an approach to improving RWM in rural Ethiopia in which impact, sustainability and local ownership of interventions are prioritised, and strategies are based upon meaningful participation of farmers (and other stakeholders). These include a shift of focus of targets from outputs to outcomes, enhanced monitoring and evidence collection on RWM with a focus on impact and sustainability, revitalising and capitalising on the DA system, paying attention to local institutions, moving towards true participation, and establishing open lines of communication to foster innovation capacity.

# Introduction

## Background

Smallholder farming is the backbone of the Ethiopian agriculture sector, the dominant contributor to national GDP and at the heart of the country’s current national growth strategy (Federal Democratic Republic of Ethiopia, 2010). Smallholder agriculture is predominantly rain fed, with small pockets of irrigation, both small-scale and large-scale. Yields are far below potential; yields of staple cereals have remained stubbornly static over the last 30 years and increases in food volumes have been achieved mainly through expansion of the arable land area (Eberhardt, 2008). Considerable potential exists, however, for enhancing food production through better rainwater management (RWM). Studies from elsewhere in the world demonstrate that even small improvements in RWM can have dramatic effects on food production (Rockstrom et al., 2007). Ethiopia has invested extensively in RWM interventions, in particular soil and water conservation and afforestation over the last 40 years, but in many areas with disappointing impact, for multiple reasons – misguided policy, authoritarian and top-down approaches guided by targets and coercion to mobilise labour, blanket approaches across vastly different agro-ecological and socio-economic contexts, or inappropriate technologies, just to name a few - which have been well articulated in previous reports (e.g. Merrey & Gebreselassie 2010). Given limited success with previous approaches towards natural resource conservation, a new approach is obviously needed, but what should it be? This question is at the center of the Nile Basin Development Challenge (NBDC)[[1]](#footnote-1) project, part of a larger Programme “Challenge Programme Food and Water”, funded by CGIAR and working in 6 River Basins (Nile, Volta, Limpopo, Ganges, Mekong, Andes)[[2]](#footnote-2). Two key elements of the NBDC approach are (1) viewing RWM as a landscape-scale issue, and (2) recognising that improving RWM successfully, and on a sustainable basis, requires a focus on institutions as well as technologies, and a new approach to planning, implementation and monitoring of interventions.

The NBDC aims to improve the resilience of rural livelihoods in the Ethiopian highlands through a landscape approach to RWM. From a landscape perspective, watersheds are conceived as socio-agro-ecological systems with social, economic and institutional networks that may cross-cut hydrological boundaries. The objective of NBDC research is therefore to ‘optimize the range of services provided by the watershed resource system in a manner that is sustainable and beneficial to a broad range of stakeholders’ (Merrey & Gebreselassie, 2010: 1). It comprises five linked projects examining: (1) Learning from the past; (2) Developing integrated RWM strategies; (3) Targeting and scaling out of RWM innovations; (4) Assessing and anticipating the consequences of innovation in RWM systems; and (5) Catalyzing platforms for learning, communication and coordination across the projects. The Nile 2 project, *“On integrated RWM strategies – technologies, institutions and policies”*, is the largest of the five projects and is centred on field research in three pilot learning sites (described below). The starting point for research in N2 is that integrated RWM strategies need to combine technologies/practices, policies and institutions, and need to be developed through innovative approaches which bring together different stakeholders. Research in this project aims to integrate land and water management, crop component technology, crop management, crop-livestock systems, pastoral systems and even agroforestry systems, with the goal of raising productivity and incomes while slowing land degradation and generating downstream benefits such as reduced siltation. Because policies and institutions can foster or discourage the adoption of productivity-increasing, resource-conserving strategies by farmers, the project also examines the extent to which policy change and institutional strengthening and reform could be combined with new technologies to spur widespread innovation.

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| 1. Rainwater Management   Rainwater management refers to interventions which enable smallholder farmers to increase agricultural production – focusing on livestock, trees, fish as well as crops - by making better use of available rainwater while sustaining the natural resource base (water and soils) in rainfed farming systems. These interventions may be at plot, farm, community, district or watershed level. Rainwater management includes soil and water conservation, in situ and ex situ rainwater harvesting, conservation agriculture and small-scale irrigation. While the term ‘rainwater management’ places the emphasis on water rather than land management, in fact most of the technologies and practices are the same as those used for sustainable land management. A rainwater management system (RWMS) therefore includes technologies and practices for managing water for production, and the policy, institutional and social dynamics and support systems necessary to optimize the benefits of such technologies and practices.  (Source: Merry & Gebreselassie, 2010) |

A central mechanism for stimulating innovation within the NBDC is the use of innovation platforms at site level (district) and national level. An innovation platform is a network of different stakeholders who come together to exchange knowledge and develop joint action to bring about change. The current diagnosis was in part designed to inform the development of innovation platforms by providing a baseline understanding of existing RWM strategies and institutional arrangements at local level. There are various elements to this. First, we were interested in how RWM interventions are planned and implemented at local level, and how different actors are involved in this process. Second, as planning and implementation processes are heavily influenced by government at all levels, we were interested in what this dominance means for local “innovation capacity”. Finally we wanted to understand the diversity of local livelihood strategies and how these might intersect with formal and informal approaches to RWM in our study sites.

## Description of the study sites

Three woredas in the Nile Basin of Ethiopia were selected for intensive study as part of the larger project. These are Jeldu and Diga in Oromiya Regional State and Fogera in Amhara Regional State (see Figure 1).

Jeldu is located 115km west of Addis Ababa in West Shewa Zone of Oromiya Regional State. It is characterized by a mixed crop-livestock system. Production of potato and barley are major livelihood strategies especially in the highland[[3]](#footnote-3) part of the woreda. Some of the current drivers of change in Jeldu include land degradation in the form of soil erosion, seasonal migration of youth to towns, and market constraints.

Diga, a woreda in the East Wollega Zone of Oromiya Region, is located 343km west of Addis Ababa. It features a mixed crop-livestock farming system with lowland-dominated agro ecology. In comparison with the other research sites, natural vegetation cover is still comparatively widespread, although deforestation is increasingly prevalent. In-migration from other areas of the country and movement within the area from the highlands to the lowlands in order to access fertile farm land are important driving forces. Main crops produced include maize, sorghum, coffee and a variety of vegetables, with production of mango and sesame in the lowlands. There are a few cases of diversion irrigation in the woreda, and wetland areas close to rivers are cultivated in the dry season.

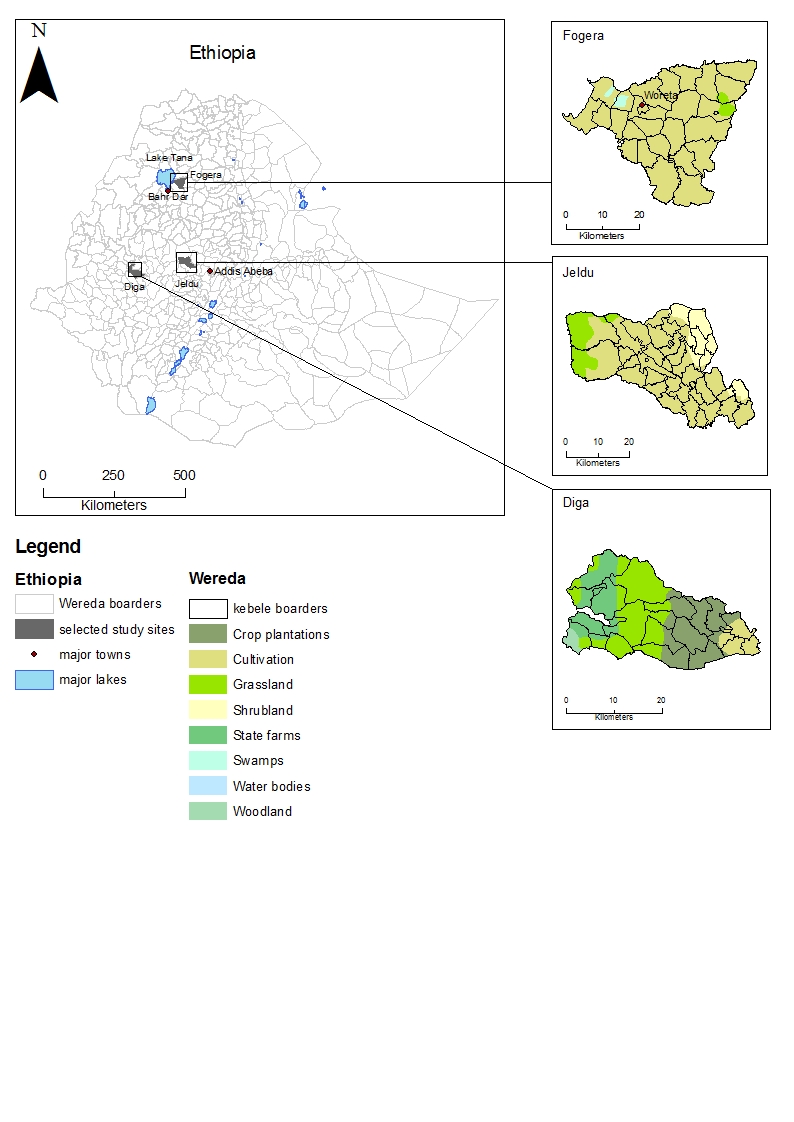
Fogera is located in South Gondar Zone of Amhara regional state, 625km north-west of Addis Ababa. Similar to Jeldu and Diga, Fogera is also characterized by a mixed crop-livestock farming system. Rice production is an important strategy for market integration in Fogera, accounting for more than 20% of the arable land. Expansion of rice production, enhanced markets, and conflict over grazing land are some of the many drivers of change in the woreda.

1. Characteristics of the study sites

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| Description | Jeldu | Diga | Fogera |
| Elevation range (m asl) | 2500-3200 | 1110-2300 | 1774-2400 |
| Agro-ecological zone (see Annex 1 for more details) | Dega and Wurch  (cool highlands, sufficient rainfall) | Kolla and Weyna Dega  (temperate midlands and warm lowlands, usually sufficient rainfall) | Weyna Dega  (temperate midlands, usually sufficient rainfall) |
| Mean annual rainfall (mm) | 900-1350 | 1376-2037 | 974-1516 |
| Rainfall pattern | Bimodal but with recent fluctuations | Unimodal | Unimodal |
| Major crops grown | Potato, barley, wheat (highland) | Teff, Niger seed, coffee, maize, barley and faba bean in the midlands; maize, sorghum, sesame, fruit trees in the lowlands | Rice in the plains; maize, millet, teff, barley, Niger seed in the uplands |
| Major sources of cash | Potato, Eucalyptus | Sesame, Mango | Rice, vegetables |
| Total area coverage | 139,389 ha  (out of which 43.4% is arable land) | 40,789 ha  (out of which 67.8% is arable land) | 102,807 ha  (out of which 67.8% is arable land) |
| Landholding size per household (min-max range in ha) | 0-4 | 0-4 | 0-3 |
| Average number of people per household | 7 | 7 | 8 |
| Market infrastructure | Mainly unsurfaced road within the woreda and this constrains the potential dairy market | Good road access to zonal town (Nekemte) | Good road access to woreda and regional town (Woreta and Bahir Dar) |

Source: Baseline survey and data provided by Woreda Offices of Agriculture and Rural Development.

1. Ethiopia and the selected study site woredas



## Methods

This baseline research aimed at establishing a broad understanding of key issues relevant to the N2 Project – a component of the Nile Basin Development Challenge Programme that aims at developing integrated RWM strategies; identifying relevant actors involved in RWM at different levels and issues relevant to Innovation Platforms. Data collection, analysis and write-up of site reports was carried out between November 2010 and December 2011, following a training attended by all researchers in Addis Ababa in early November 2010.

In each of the three study woredas, five kebeles were identified for in-depth primary data collection. Kebeles were sampled purposively to capture a range of agro-ecology (highland/midland/lowland), presence/absence of RWM interventions, and high/low levels of natural resource degradation. As far as possible kebeles were selected from within the catchments which have been instrumented for hydrological analysis (this has been done in each study site under another component of the N2[[4]](#footnote-4) project); at least one kebele from each woreda was required to be from this catchment.

1. Selected kebeles for the baseline research

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| --- | --- | --- | --- | --- | --- |
| **Woreda** | **Kebele** | | | | |
| Fogera | Kokit | Wej-Arba Amba | Diba-Sifatira | Shaga | Alem Ber |
| Diga | Gudisa | Bikila | Arjo Kote Bula | Lalisa Dimtu | Adugna |
| Jeldu | Chilanko | Seriti | Kolugelan | Goro | Shukute |

A broad suite of methods and tools for data collection was used, including:

* + Community resource mapping and participatory timelines
  + Three focus group discussions in each kebele (male and female groups separately for livelihoods analysis, and a mixed group focusing on innovation capacity; each group captured a range of ages and wealth status)
  + Key informant interviews to capture the diversity of points of view with
    - * farmers, including model farmers (both men and women);
      * Development Agents (DAs) covering crops, livestock and natural resource management;
      * kebele and woreda experts and heads from various line ministries (including Agriculture, Land Administration and Environmental Protection, Finance and Economic Development, Water Resources, Cooperatives, and Credit and Saving Association);
      * kebele and woreda administrators;
      * staff of nearby agricultural research centres and universities;
      * NGOs; and
      * private sector actors.
  + Secondary data collection from kebele and woreda offices.

Semi-structured interview guides covering the main areas of innovation, planning and implementation of RWM and livelihoods were developed in advance of the field work and introduced, discussed and amended in a methodology workshop in Addis Abeba in November 2010.

In each site, a team consisting of researchers from a nearby Agricultural Research Centre (Adet Research Centre for Fogera, Bako Research Centre for Diga and Holetta Research Centre for Jeldu) and a regional University (Bahir Dar University for Fogera, Wellega University for Diga and Ambo University for Jeldu) were responsible for carrying out data collection, analysis and write-up of site reports. The research teams were supported by researchers from ILRI, IMWI, ODI and Addis Ababa University, who also developed question guides and tools for data collection and analysis, provided feedback on site reports and wrote the present synthesis.

## Caveats

With regards to the design, the small number of sites visited represents the most important limitation. Given the heterogeneous nature of the Ethiopian Highlands, both in terms of bio-physical and socio-economic contexts, distilling lessons that have the potential to be valid at a more general level, as opposed to those messages that are very situation-specific, is by nature limited and needs careful attention. The information for this baseline study has been collected in three research sites only. The authors are fully aware that based on such a small sample, statements made with respect to planning and implementation of natural resource management in general and rainwater management interventions in particular, are highly problematic. This is even further accentuated by the fact that study sites cover only two regions. Sites selection for the NBDC included a range of criteria, not least whether or not there is a potential to contribute to improve the effectiveness of RWM and NRP planning and implementation. Areas in the Ethiopia Highlands where NRM seems to be successfully implemented, such as many parts of Tigray or northern parts of Wello, are not represented in this study. As such we are fully cognizant of the bias related to the site selection that characterizes this baseline study and its findings.

Because of the above shortcoming, we do not have any intention to make statements that are representative across the whole country, but only those where we are confident that they relate to the study sites. Nevertheless, we believe that a number of lessons can be learned from our research and that the chosen study sites are not completely different from many other areas of the Ethiopian Highlands.

The research and data collection was carried out in relatively short time. At no point, therefore, could this study have attempted to rigorously assess planning and implementation procedures in the required depth to assess their impacts on the likelihood of sustainability of interventions.

Although as many stakeholders from village, wereda and regional level were included as possible, the findings nevertheless rely on a limited number of people having had the chance to share their experience and perception on planning, implementation and innovation processes of rainwater management interventions.

# Past interventions, politics and policy in relation to RWM

Ethiopia is often cited as an example of severe natural resource degradation. As a country reliant on an agricultural sector dominated by smallholder farming, land degradation presents a major challenge in terms of agricultural productivity, food security and rural livelihoods. Considerable attention has been placed on enhancing production through better land and water management and there has been extensive investment in interventions, particularly soil and water conservation and afforestation. Various programs have been implemented on farms and community lands over the past four decades, undertaken by government agencies in collaboration with national and international organizations. However, success to date has been limited. A review of past interventions, policy and politics is useful in order to gain an understanding of the current policy situation.

It is widely documented that rainwater management interventions in Ethiopia have historically been implemented in top-down fashion. Keeley and Scoones (2000: 94) comment that 'a number of characteristics of the Ethiopian state have remained remarkably persistent over time: these include a tendency towards authoritarianism, hierarchy, centralized rule and lack of transparency’. In order to understand why top-down approaches have been so prevalent, it is important to bear in mind that 'all adult Ethiopians will have lived with at least one extremely coercive government; either the communist military rule of the Derg or both this and the imperial regime of Haile Selassie' (Harrison, 2002: 599). It is therefore likely that this authoritarian history has had a significant influence on the interpretation and development of policy and the mind-sets of officials and farmers alike.

Historically Ethiopian agriculture was organized by an essentially feudal land tenure system until the end of the imperial regime of Haile Selassie. Land ownership was a complex combination of communal, church ownership, private and state holdings which varied throughout the country. State or government holdings tended to be most prevalent in the less densely populated and pastoral areas of the lowlands, communal ownership locally referred to as "Rist", and church holdings characterized the northern highlands and private holdings were a feature of the South (Yirga, 2008: 127). Campbell (1991) writes that under the imperial regime attempts to improve land, agricultural practices and rural technologies were hindered by the effects of this complex system which was dominated by absentee landlords, local administrators and church estates. Concentration of land in the hands of elites and an exploitative tendency resulted in a widespread sense of insecurity. The absence of secure land tenure for the majority of farmers meant they were understandably unwilling to invest in conservation measures.

In 1974 Haile Selassie was overthrown by the Derg, which established a Marxist military government led by Mengistu Haile Mariam. This government carried out radical land reform with the aim of ending the landlordism associated with the imperial system. The regime implemented a range of policies intended to promote the collectivization of agriculture, including large-scale resettlement and villagization schemes. Land was nationalized through the 'land to the tiller' program which aimed to equalize land holdings and made private ownership of land impossible. As part of the attempt to equalize holdings there was periodic redistribution of land. The resulting uncertainty of tenure is often used to explain farmers' reluctance to invest in improved water and land management.

Projects addressing soil degradation and improved NRM accelerated from the late 1970s. This was partly due to the introduction of new forms of rural political organization called Peasant Associations (PAs). PAs were administrative and geographic units organized to undertake a range of political, agricultural and administrative tasks under the direction of central government. They became the 'the basic social, economic and developmental unit in the rural highlands and in practice the administrative and law and order units in their specified areas' (Merrey & Gebreselassie, 2010: 37). PAs became the primary mechanism for mobilizing rural people and made it possible to effectively organize rural development work. Shifting global dynamics also played a role in the development of such policies. Pankhurst (2003: 65) writes that 'The Derg's interventionism in natural resource management stemmed from an allegiance to socialist policies advocated by the Eastern Block’ and at the same time the famines of the 1970s and 1980s led to large increases in food aid. Views among donors about linkages between drought and deforestation led to the establishment of an ‘environmental rehabilitation discourse’ which prompted massive government initiatives, supported by donors and NGOs, and utilized food-for-work as payment for labour (Keeley and Scoones, 2000).

The national soil conservation and afforestation efforts that took place during the late 70s and 80s have subsequently been criticized for a number of reasons including: top-down planning and implementation; standardized intervention packages based on inadequate scientific and technical knowledge; the use of quota systems; lack of an integrated or systematic watershed approach; limited consideration of variations in agro-ecological conditions; coerced participation with little regard for the views of the people (Merrey and Gebreselassie, 2010: 54). These programs were therefore widely perceived as government-imposed activities. As Keeley and Scoones (2000: 103) note, terraces became a ‘clear symbol of the presence and authority of the state in rural areas… ostensibly technical interventions reordering rural social space and livelihoods'. Farmers often did not see the benefits, particularly as interventions were organized through a highly centralized system which reinforced state power and undermined community management. Although participating farmers received food rations in return for their work, the structures created often served no positive purpose and at the end of the Derg government, a large proportion of the works were either deliberately destroyed or abandoned (Merrey and Gebreselassie, 2010: 54).

The Derg was toppled in 1991 and the Ethiopian Peoples' Revolutionary Democratic Front (EPRDF) came to power following a period of transitional government. The new government committed itself to a decentralized political system and a new Constitution. Since the current government took over there has been a gradual shift towards more participatory community-driven approaches. According to Keeley & Scoones (2000: 107), the noticeable softening of approach and increased emphasis on ‘awareness raising’, consultation and building projects from the ‘bottom-up’ was prompted largely by reactions to previous policy under the Derg which was perceived to be top-down and inappropriate. Added to this was growing talk of ‘sustainability’, ‘integrated natural resource management’ and a commitment to involve farmers in agricultural development activities, including an appreciation of their knowledge and technology (ibid., 108).

Current RWM programs are now taking a more systematic approach with an emphasis on consultation and planning on a watershed basis. Attempts have been made to address the issue of land tenure through programs, implemented across all the major regions, promoting the mapping and certification of land use rights. This appears to have had a positive impact, although there are concerns that land certification is being used as a political tool. There is also more of a focus on enhancing farmers' incomes and food security. As Merrey and Gebreselasie (2010: 55) assert, 'Improved water and land management should be a means to improving peoples' lives, not an end in itself'. However ‘top-down blueprint approaches remain pervasive with agricultural extension largely focused on technology transfer’ (ibid., 41). Programs remain quota driven and focused on the promotion of 'best practice' packages, some of which are inappropriate. There is also considerable evidence that many of the soil and water conservation structures promoted to date have low or negative returns and are often not perceived positively by farmers (Merrey and Gebreselassie, 2010). This is perhaps partly because such approaches are not flexible enough to be able to respond to varied ecologies, ecological problems and diverse forms of livelihoods.

In summary, although there has been a considerable reorientation of policy, this has not necessarily been carried through to implementation, for a variety of reasons. Reviews of Ethiopian NRM policy have highlighted the role that external donors have played in the adoption of participatory approaches. Keeley and Scoones (2000:109) observed that increasing emphasis on participation in the international development literature resulted in the need to couch applications to donors in participatory language. If the concern with participation has arisen mainly in response to funding needs then, as Harrison (2002: 593) has noted, ‘the content of the participation itself may be questionable'. The adoption of genuinely participatory approaches is reliant on 'attitudinal change in those individuals implementing policy' (ibid., 602) which is often not easy to accomplish and cannot simply be implemented. In their review of rainwater and land management in the Blue Nile Basin, Merrey and Gebreselassie (2010: 5) comment 'Although guidelines and training programs emphasize “participation” of communities, it will take many years to change the dominant culture of government and indeed communities from an authoritarian to a democratic mindset'. Creating a decentralized demand-driven system will take time. The rest of this paper aims to explore the current policy planning and implementation process in more detail in order to understand the existing gaps and suggest possible ways forward.

# Planning of RWM

The rationale for focusing on planning and implementation of RWM was that at the outset of the project it was recognised that a number of national and regional policies and strategies in relation to RWM existed, including very detailed guidelines, for example for participatory community watershed management (Desta et al., 2005), but that planners, in particular at lower administrative levels, did not have sufficient tools and skills available to engage at a landscape level for effective integrated and multi-sectoral planning and implementation of RWM. In sum, one of the hypotheses that guided this research was that a gap exists between available policy and guidelines and specific implementation.

## Planning process

As well as characterizing the planning process, the baseline assessed its effectiveness in terms of the extent to which RWM planning is:

* + evidence-based;
  + tailored to social and ecological niches;
  + cross-sectoral; and
  + participatory.

Opportunities and barriers to strengthen RWM processes were then identified.

Our research findings indicated that planning is usually carried out on an annual basis, corresponding to the budget cycle. Respondents described the theoretical/official planning process in some detail (Box 1). However the reality on the ground is rather different, as will be seen below.

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| 1. Theoretical planning process for RWM   Theoretically, plans are formulated at the lowest level and subsequently travel upward through the hierarchical arrangement of administrative structures as follows:   * **Cell** (*Shane* in Oromiya, *And-le Ammist* in Amhara)**.** A cell is a group of 5 to 6 farm households, usually including one model farmer. In theory this is where planning starts. * **Development team** (*Gare* in Oromiya, *Yelmat budin* in Amhara). A development team is composed of 25 to 30 households. This collective of farmers is critical for problem identification and priority-setting. * **Sub-kebele**. This comprises between 300 and 500 households (approximately one-third of the population of the kebele), and is led by one of the kebele DAs. At this level, a consolidated list of priorities is agreed and passed on to the kebele. * **Kebele**. It is here that we find elected officials representing different sectors. It is also at this level that a consolidated plan of development priorities is elaborated. * **Woreda**. 20 to 30 Kebeles make up a woreda, where kebele priorities are consolidated and reconciled with the available budget. The woreda budget is a combination of local revenue and block grants from the central government, which is allocated to the different sectors and which includes both recurrent costs (e.g. salaries) and capital costs (e.g. investments). The woreda cabinet, the executive organ including the heads of all the sector offices and the woreda administrator, who is elected by the woreda council, is responsible for final approval of plans, which are then sent to the next higher administrative level, the Zone. * **Zone**, and subsequently **Region**. At zonal and regional levels the process of consolidation and reconciliation is repeated and a final regional plan is formulated. |

Ideally, key actors are therefore farmers, DAs, the kebele administration, sector experts and the woreda administration. In each Kebele three DAs are stationed, one each with a background in crop science, livestock science and NRM (where irrigation is important, often a DA with a background in irrigation is posted too). At woreda level, the Office of Agriculture and Rural Development is the main relevant sector office, with multiple experts representing different disciplines including crop science, livestock science, NRM and small-scale irrigation. The Office of Water Resources mainly deals with provision of water supplies for human consumption, but is also involved in the promotion, design and implementation of small-scale irrigation.

In contrast to the ideal planning process and actors involved described above, our survey of local actors revealed a different perception concerning how planning is actually done and who is involved. Perceptions varied depending on the actors being questioned. Of course, perceptions do not necessarily mean that the actual process is as perceived by that specific group of actors and we acknowledge that strategic behaviour can also bias how questions are answered.

Farmers did not consider that planning was done using a bottom-up approach, i.e. that their problems, capacities and priorities were driving the planning process, but rather that plans originated with the woreda and were transmitted downward for implementation. They reported that their only involvement was attending meetings organised by the Kebele council where plans were presented to them. Farmers did not consider the current system as following the principles of locally-led planning of RWM focusing on local needs, and felt that they had been demoted to mere implementers of plans with no role in developing them. In Fogera respondents stated *“Farmers seem to have had little or no role at all, apart from implementing whatsoever plan is brought to them*”. In part this might relate to watershed management often not being perceived as in the direct interest of farmers, who would rather see more interventions that benefit them more directly, such as investments in small scale irrigation or improved crop varieties.

Development Agents, on the other hand, reported that plans are partially drafted at kebele level in collaboration with farmers and kebele representatives and submitted to the woreda. However DAs stated that the consolidated plans they receive back from the woreda for implementation are often considerably different to the plans they originally submitted. Plans will have been modified by technical experts, who are only available at woreda level; they may therefore alter plans to correspond to required technical standards. They then have to be approved by the Kebele council before being sent back to the woreda, but are said to be developed in a top-down fashion. These plans are sub-divided into plans for the three sub-kebeles and subsequently for development teams and the cells. The plans received from the woreda can theoretically be modified according to the capacity and potential of the kebele; however, DAs mentioned that usually there is not much room to change priorities as plans are shaped to a large extent by implementation quotas assigned to woredas, and subsequently allocated to kebeles. In Fogera, for example, the Kebele together with the DA identified a severely degraded watershed, *Zibura* Watershed, in their plan as one to focus on for rehabilitation. When the Kebele received the approved plan from the Woreda, however, a different watershed (*Gindenur*) had been identified for rehabilitation. Respondents interpreted this shift as a move by Regional authorities to establish a ‘Regional model watershed’ close to the road which would be easily accessible, but which over-ruled their agreed watershed for rehabilitation.

Woreda experts’ description of the system was quite similar to that of DAs: they receive plans from the Region which they adjust to the woreda situation and then send back to the region via the zone. Based on the plans the woreda offices receive from the respective Regional Bureaux, quotas are assigned to each kebele. Woreda experts mentioned the difficult task they face in reconciling plans with available budgets and government policy and strategic plans/directives whilst also taking account of local issues and priorities as formulated in kebele plans. There seems to be considerable tension at the woreda level as bottom-up planning – focusing on needs and priorities as formulated by Kebeles – collides with top-down planning – implementing plans received from higher levels that reflect regional and national priorities, in the form of quotas that woredas must achieve. This tension is inherent in the planning process: meeting quota targets while taking account of local priorities is a difficult task and the former tends to take precedence.

In terms of RWM, two different levels of planning and implementation have to be distinguished, though. Firstly, those interventions which are being carried out by farmers themselves on their own land, such as drainage ditches, furrows, contour ploughing, crop rotation and fallowing, mulching etc., for which no kebele-wide plans exist but which farmers do out of their own initiative as part of their ongoing cropping practices. Secondly, RWM interventions at larger scale such as watershed protection, community forest management, area closures, gully rehabilitation, grazing land management etc., for which collective action is needed and for which more planning and coordination is required. It is with regard to these latter plans where farmers feel that the practice and theory of planning are quite different and where it seems that the planning process is dominated by a top-down approach and local realities are not well reflected. In part this is because responsibilities differ for RWM at different scales. Whereas farmers are responsible for taking decisions about what to do on their own plots in terms of RWM, larger scale RWM interventions at watershed level fall under the responsibility of the woreda. Depending on decisions taken, this might mean that some farmers lose out in the short term for the benefit of longer-term improvements. An example is area closures, which might lead to reduced area where livestock may be grazed in the short term aiming at creating longer-term benefits of reduced soil erosion, improved vegetation cover and improved water availability. Differing perceptions of the degree of involvement in planning and decision making can thus be explained in part by different responsibilities of actors for RWM at different scale.

One of the key findings of the planning process for RWM from our research is its highly fragmented and uncoordinated nature. Sector specialists plan for their specific area, e.g. livestock specialists are responsible for delineating grazing land, identifying degraded grazing areas for closure, or integration of forage production with SWC. NRM experts prepare land use maps for watersheds. Irrigation experts identify suitable land for irrigated crop cultivation and select the most appropriate crops. Not only is coordination lacking across sectors within a woreda, but there is little integration across woredas and watersheds. Although some respondents said that downstream implications of interventions are considered, no evidence could be found whereby plans from one woreda were actually aligned with plans made in neighbouring woredas.

Identification of technologies, beneficiaries and sites was another issue where different views among stakeholders were evident. DAs usually identify areas in kebeles that should be included in RWM plans based on degradation levels, and identify who should benefit from which technology based on an assessment of suitability of a technology for a specific area and the extent to which farmers are assumed to be able to adopt those technologies. Respondents however identified cases where sites identified in kebele plans were later disregarded by plans coming down from the woreda and different sites were identified for NRM interventions, driven by considerations such as ease of accessibility.

A key factor that determines the way planning is done at local level relates to the fact that the Federal Government has defined targets it aims to achieve within the five-year period 2011 to 2015 as set out in the Growth and Transformation Plan (FDRE, 2010), the overarching development plan for Ethiopia. In terms of Natural Resource Conservation, for example, the GTP formulates a target of 10.21 million hectares of land under rehabilitation by 2015. These national level targets are broken down into targets to be achieved at each administrative level and are translated from targets over the five-year period into annual targets to be achieved by each sector ministry at each administrative level. Concretely this means that the regional BoARD, for example, issues each woreda with a quota of how many hectares of watersheds need to be protected. Woredas then further break down these quotas to Kebeles, based on an assessment of each kebele’s potential, defined by indicators such as accessibility to markets, agro-ecology, number of active labour force, farmers’ likelihood of adoption of new technologies, past quota achievement, and repayment status on inputs delivered in the previous year. Although there is nothing wrong with setting targets to be achieved, the lack of flexibility in applying targets and the narrow focus on target achievement (outputs) instead of target outcomes, i.e. the area under rehabilitation rather than the quality and sustainability of the activities implemented as part of the rehabilitation, their contribution to livelihood needs, and their economic viability, both at household and community level, make them problematic[[5]](#footnote-5). Respondents said that there is some room for modification of quotas if sector specialists can reasonably defend their plan, but it seems that such adjustments are very limited in practice.

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| 1. Private versus social perspectives on costs and benefits of natural resource management   Individuals and society value investments in natural resource management (NRM) differently – in part because of the long time lag between when investment costs have to be borne and the time when the investments start to become profitable. Also, society will value external effects, both positive and negative, of NRM, such a reduced siltation of water reservoirs, while individuals will not consider such off-site costs when deciding whether or not to invest in NRM. Finally, society might consider it worthwhile to invest scarce resources in a specific area which is of no great value to an individual and would thus be not considered for investing resources. An example might be degraded hillsides which are considered as common pool resource by community members, and therefore no individual assumes responsibility, whereas society – represented by government – considers the health of such areas as a public good and considers investing resources as worthwhile.  Private investors, when deciding to embark on an investment project will have a number of criteria to evaluate whether or not to invest scarce resources, but one criterion is – that of profitability or the question of whether revenues from an investment exceed the costs over the lifetime of the project. For a society, the question is more complicated. Although society also faces budget restrictions and should invest available funds where there is value for money, other criteria such as inter- and intra-generational equity or equitable distribution of resources among different social groups or regions have also to be respected. Society is also involved in providing public goods where neither private investors are engaged nor a market and prices exist to act as signals to producers and consumers.  The distinction between the individual and the social perspectives can also be explained by asking what farmers will do under certain conditions (positive question) and what society would like farmers to do under the same condition (normative question). Farmers decide how to use their land in the light of their own objectives, production possibilities and constraints. Society, on the other hand, has social goals such as ‘sustainable development’ or ‘avoiding degradation of natural resources’ to achieve.  On-site costs of land degradation are mainly borne by the land users in the form of reduced production or increased production costs. Off-site costs of land degradation are transferred to society. Thus, costs of land degradation and benefits of conservation are distinctively different for land users and society. Land users decide how much conservation to undertake, based on weighing the costs and benefits of the degrading practices compared to the conservation practice. This usually only includes on-site, but not off-site costs and benefits. The result would be one where the individual farmer would tolerate a higher level of degradation than would society. The following figure presents marginal damage (MD) and marginal abatement costs (MAC) of land degradation from the two different perspectives.  With increasing land degradation, the marginal damage to the land user increases. If no conservation is undertaken and land degradation reaches e0, the total damage to the land user would equal the area (a + b + c + d). If the land user considers this total damage to be too high, he/she would invest in NRM. This is shown by the marginal abatement cost (MAC) curve. For each additional unit of land degradation prevented, the costs for conservation rise. The area below this curve indicates the total costs of reducing land degradation from the level e0 to zero. The optimal level of land degradation from a farmer’s point of view would be eL, where net benefits of reducing degradation are maximised, i.e. where marginal abatement costs (MAC) equal the marginal damage (MDL) to the farmer. Because society considers off-site costs as well, the damage function for society (MDS) is steeper and the optimal level of land degradation would be eS, which is significantly lower than eL.  eS is lower than eL because the damage of land degradation inflicted to society is bigger than that to individuals, because external costs of land degradation are not included in farmers’ decisions. Two solutions are possible: either society provides an incentive equal to the area (g), which equals the amount by which the additional costs exceed the additional benefits to the land user of reducing land degradation from e0 to eS. Alternatively, society needs to find ways (through regulations or taxation) to motivate farmers to internalise the external costs of land degradation, with the goal of bringing the two marginal damage curves together.    Source: Ludi, 2004 |

## How effective is the planning process at woreda and kebele level?

The four indicators identified in the initial N2 project proposal for assessing the effectiveness of planning at woreda and kebele levels were whether it was (1) evidence based, (2) tailored to different social and ecological niches, (3) cross-sectoral, and (4) participatory. We considered these four indicators also to be necessary for helping us to assess whether RWM practices are sustainable, i.e. environmentally sound, economically viable and socially acceptable – and conforming to government policy and guidelines, and thus offering the required incentives for their implementation at household and watershed level. We now take these indicators as a basis for further discussion about planning effectiveness.

Is planning *evidence* based?

A key principle of policy making – and of good planning - is that it must be based on credible, practical and operationally relevant evidence (Young and Court, 2004). Our research found that while basic information is collected from farm and household level and used to formulate Kebele-level plans, priorities formulated at community level were largely lost in the development of final plans for the reasons discussed above. This leads to plans that do not sufficiently take into consideration local conditions and capacity, for example in terms of agro-ecology, social structures or available labour force, and kebeles are frequently burdened with quotas of RWM investments which they cannot achieve, or are bound to implement RWM technologies which are not suited to the local agro-ecology.

Is planning tailored to different *social and ecological niches*?

Closely linked to the above point is the issue of whether planning is done taking local realities (social and ecological niches and constraints) into consideration. Respondents alluded to numerous examples where technologies prescribed in the plans did not match local conditions, for example because soil characteristics did not allow certain activities such as rain water collection ponds. In Fogera, for example, farmers reported a case where a water harvesting pond was constructed without due consideration of appropriate siting and soil characteristics, so accumulated water was quickly lost through seepage. On the other hand, technology support requested by farmers, such as for developing low-cost irrigation where it would be feasible, was not provided.

Is planning cross-sectoral?

One of the key shortcomings of the current RWM planning process is that it is done in an uncoordinated manner, and synergies between the different sectors – crops, livestock, trees, natural resources, water – are not exploited. There were cases, for example, where the Office for Water Resources was not involved in planning of soil and water conservation (SWC), despite the underlying assumption that SWC will contribute to ground water recharge which in turn affects availability of water in hand dug wells.

Is planning participatory?

It is assumed that if land users are involved in planning activities related to RWM, ownership of investments and practices will be enhanced and farmers will be more likely to invest labour and cash in maintaining them. It is also assumed that by involving a range of stakeholders in the planning process, potential conflicts of interests can be identified early on and addressed in subsequent planning. Local communities are involved in drafting kebele-level plans through discussions of problems and prioritisation of activities together with kebele executives and DAs. Plans developed by higher authorities and based on quotas rather than local priorities, however, do not sufficiently reflect what was discussed at local level. Communities feel disenfranchised as they feel their contributions to plans have not been sufficiently recognised, and they therefore do not feel much ownership of the plans they are supposed to implement so that quotas can be met.

DAs emerge as a key actor in the planning process. They are the main interlocutor between government and farmers, and a strong national cadre of DAs with a clear mandate and capacity to support farmers will be vital in achieving more effective RWM. However, a picture emerges of DAs who frequently feel under-supported, demotivated and caught between the demands placed on them by government and the expectations of farmers. This “crisis” of the DA system is summarised in Box 4.

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| 1. Business as usual: the DA crisis   DAs have the most contact with farmers and should play a critical role in supporting implementation of RWM. They are supposed to provide politically neutral technical support. However they face many challenges:   * Training is inadequate. * They are caught between farmers and government, with the difficult task of reconciling top-down plans and quotas with local concerns and needs. They transmit information down to farmers but struggle to pass ideas and reflections back from farmers to higher levels and do not typically monitor the results of interventions. * Their voice is not generally heard in the planning process. * They are often poorly motivated because of poor pay. * Government often involve DAs in administrative and political matters, affecting the relationship and degree of trust between DAs and farmers. |

## Conclusions in relation to planning

In summary, there are at least five issues with the current planning process that need to be addressed if improving RWM is to become an integral part of sustainable agricultural development:

**The discrepancy between policy and practice.** While participation is a central plank of policy, and land users are considered to be the main driver of planning and implementation of RWM at local level, in reality plans are guided by quotas supplied by higher-level administrative units.

**Notions of participation.** There is a very different understanding of the word ‘participation’ among different actors – in reality, participation in the context of NRM planning and implementation tends to mean mobilising farmers to implement something, rather than providing incentives to engage in voluntary collective action and involving them in decision making (Harrison 2002). Although at kebele level, planning processes attempt to be participatory and land users are involved in discussing problems and identifying priority RWM interventions based on local agro-ecological and social realities, these plans do not necessarily get picked up sufficiently in planning of activities at higher administrative levels.

**Incentives for DAs.** Although at local level DAs try to reconcile as much as possible plans developed at local level with those plans received from the woreda to take account of local realities, in the end woreda plans with set quotas tend to be approved for implementation because quotas are used for performance monitoring. If DAs do not meet their quotas there are repercussions for their performance rating and their prospects of promotion. In general, DAs could play a more effective role in local planning if they were better connected with higher levels of government in terms of support and two-way communication.

**Failure to anticipate conflicts.** Because plans are developed without sufficient recognition of local realities, conflicts at local level can arise. Most prominent are examples related to small-scale irrigation where down-stream water use was insufficiently recognised, but also conflicts within watersheds when, for example, areas previously used for grazing livestock were closed off for rehabilitation, increasing pressure on existing grazing land.

**Missed opportunities for sustainability**. Developing plans without sufficient local participation misses opportunities to tap into cultural practices and institutions which would make it easier to implement RWM and could enhance the sustainability and ownership of interventions.

Overall our research has identified a key dilemma in relation to planning that needs to be resolved if RWM interventions are to be owned by farmers, be sustainable, and make a meaningful contribution to improved environmental management and better livelihoods: National plan, output targets and a generally top-down planning focus, versus devolution, decentralisation and participation in planning and co-development of innovations at lowest possible level.

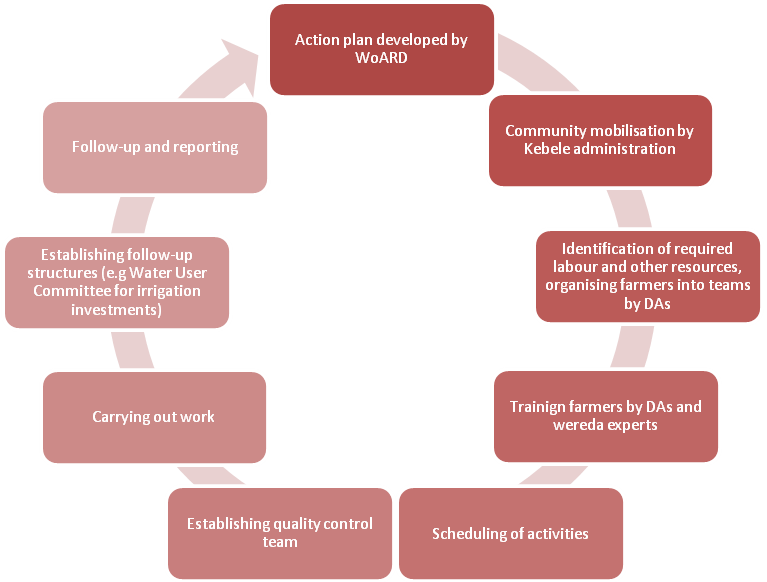
These features of the planning process have direct implications for the way in which RWM is implemented and the effectiveness of interventions on the ground. This is clearly evident in the discussion of findings on implementation which follows below. After this we suggest a number of recommended ways forward to strengthen the planning and implementation of RWM and help overcome these dilemmas.

# Implementation of RWM

## Actors involved in implementation

As in the case of planning, a range of different actors is involved in implementing RWM practices: farmers, development agents, Kebele administration, technical experts from relevant line ministries at different levels (Agriculture, Water, Cooperatives, etc.), agricultural research centres, credit and savings associations, Woreda administration, and NGOs. Again, farmers, DAs, Kebele administration, Woreda NRM and irrigation experts are the key actors. Farmers are key implementers of RWM and receive technical support from DAs. Two types of RWM intervention should be differentiated – those practices farmers implement themselves on their own land (e.g. drainage furrows, mulching, contour ploughing, crop rotation and fallowing) and which are carried out alongside normal farming practices; and those requiring larger investments, coordination across a watershed and more technical know-how such as the construction of water harvesting ponds, hillside closures, gully rehabilitation or terracing, and which are implemented by farmers in the form of NRM campaigns under close supervision of DAs and with technical inputs from woreda experts.

1. Schematized implementation cycle of RWM interventions



## The implementation process

Farmers are usually organised into small teams which are easy to supervise. Participating in campaigns is compulsory for farmers and non-participation results in fines. Respondents alluded to complaints that farmers had to provide labour on investments which they had not identified as priorities but were imposed on them from higher administrative levels, while areas they had identified as in need of rehabilitation, for example, were not considered (see examples cited above in the discussion of planning processes). In part this can be explained by different points of view whereby farmers tend to prioritise investments on their own land or in their vicinity having short-term benefits, whereas woreda experts might prioritise investments with a longer time horizon and in areas not considered as being of ultimate benefit to farmers (such as the protection of upper parts of a watersheds which yields only long-term benefits and to a group of people less easily identifiable).

Another issue mentioned was that many of the RWM and NRM implementation activities are carried out as one-off campaigns to achieve targets without due attention to the future maintenance and sustainability of interventions. In Diga both farmers and DAs reported that afforestation activities were carried out by mass mobilisation and that thousands of seedlings were planted, but that most of these seedlings did not survive for long. Reasons mentioned by respondents were that afforestation areas were selected by experts without due consultation with farmers. Farmers considered the selected afforestation areas as being important for cropping and grazing and the afforestation program as offering insufficient benefit to compensate for the losses; therefore, they did not carry out the planting with care and, once the trees were planted, did not manage the area to protect the trees but, for example, continued to graze livestock there.

DAs and Kebele officials are responsible for following up on projects where labour has been provided by farmers, monitoring progress and identifying areas where further technical training of farmers might be required. Once the quality committee approves the investment, responsibility is handed over either to the land owner for follow-up maintenance or, in the case of investments on communal land, to the community. As DAs are evaluated on achievement of quotas, i.e. on outputs but not on outcomes, implementation is often of low quality as this does not matter for appraisal of their performance. Also, follow-up maintenance is often neglected for investments being done by campaigns as ownership is limited and longevity of investments is not a criterion for performance appraisal.

DAs report progress on achievements to woreda experts, who are in principle also responsible for ensuring that investments are maintained by farmers. During campaigns, woreda experts visit kebeles to follow up on progress and assist in technical matters where needed. Such support and follow-up, however, seems to be infrequent during the rest of the year. Regular monitoring of investments is thus not happening. This is in part due to the limited number of technical experts at Woreda level and their limited budget and facilities to visit kebeles (e.g. cars and motorcycles), but a lack of interest on the part of woreda experts and the absence of incentives for them to visit kebeles and follow-up on RWM activities seem to be equally important. Where monitoring is carried out and successful interventions and sites are identified, these are used for learning among woreda experts and farmer training through site visits.

## Conclusions in relation to implementation

There is a long tradition of RWM interventions in the study sites, particularly those implemented by farmers on their own land, alongside normal cropping and farm management practices and involving little or no costs. Other interventions which are more labour= and cost-intensive and need coordination across several farms or a watershed are much less likely to be sustainable. There are at least six reasons for the poor sustainability of these interventions:

**Lack of relevance to local priorities.** As discussed, plans are not necessarily congruent with local needs assessment.

**Weaknesses in technical design.** In some cases DAs lack the required technical skills, or do not have access to information about the range of possible technologies or practices,

**Lack of voluntary collective action.** Compulsory campaigns to implement RWM do not inspire ownership.

**Lack of clear governance arrangements for interventions on communal land.** Although farmers would not necessarily be motivated to sustain interventions on their own land unless they perceived them to have clear value (both direct financial and non-financial), the weak enforcement of rules for management of communal resources (and low penalties for violations) creates a disincentive for individuals to invest in managing these better.

**Poor follow up and monitoring.** There is very little follow up by DAs and Woreda experts as performance monitoring is based on outputs, i.e. quota achievement and not on outcomes or sustainability/longevity of interventions.

**Focus on isolated technical interventions.** There is typically a narrow focus on isolated technical interventions, such as bunds or ponds, and very little attention to supporting interventions that might be needed, such as changing patterns of water use or land management.

This research did not assess in detail the performance of particular interventions and practices and their contribution to enhanced crop productivity, water productivity or livelihoods, nor issues around land management and how this could be integrated with the application of specific RWM technologies. These are key issues which need to be better researched and understood in order to develop more effective RWM strategies and implementation approaches. Strengthening monitoring and evidence collection functions of kebele and woreda officials on the impact and effectiveness of RWM interventions would make a huge contribution.

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| 1. Experiences from Tigray – the MERET Project   MERET - Managing Environmental Resources to Enable Transitions to More Sustainable Livelihoods – or “Land” in Amharic, is a government-implemented project funded by WFP which aims at reducing vulnerability and food insecurity in Ethiopia. It is primarily focusing on enhancing land productivity through natural resources rehabilitation through Food-for-Asset building activities.  Starting in 1999 / 2000, WFP and the Natural Resource Department of MoA moved away from food-for-work approaches to natural resource conservation by broadening it to include a livelihoods component and thus created MERET in 2003. MERET adopted a community-based participatory integrated watershed development approach, retained the focus on rehabilitating degraded lands through soil and water conservation and reforestation but added a range of productivity improvement and income-generating activities to better address food security issues, such as horticultural crops, animal fattening with improved forage production, and bee-keeping, which brought significant improvement to beneficiaries’ livelihoods and incomes. These livelihood packages were supported by low-cost soil fertility management techniques (compost making) and small-scale irrigation practices, to increase productivity, as well as rural roads construction to improve connections between villages and to link villages to wereda capitals, and in particular to markets. These newly introduced technologies led to a number of changes: water demand for small-scale irrigation increased which could increasingly be met as catchments were protected and water infiltration enhanced, the production of high-value crops increased household income and improved livelihoods, and awareness was raised between the links of increased upstream natural resources conservation, water harvesting and soil and water conservation and downstream benefits of enhanced water availability. The achievements in terms of livelihood improvement through income generating activities alongside existing natural resource management interventions contributed to a shift in attitudes about FFW and allowed the shift from food aid to development.  A number of factors are thought to have been especiaally important for the success of MERET:   * it has a distinct geographic concentration on food-insecure communities in Amhara, Tigray, Oromiya, SNNPR, Dire Dawa and Somali Regions; * it focuses specifically on linkages beyond natural resource management interventions (such as farmland terraces, hillside terraces, seedling planting, check dam construction, small earth dam construction, community pond construction, micro pond construction, spring development, rural road construction, moisture conservation and area closure) to include livelihoods and income-generating activities that consider the community’s economic and social needs when planning conservation; * it focuses on women, their inclusion in planning and management, and the prioritization of interventions that reduce women’s work burden while encouraging their empowerment; * it has a focus on knowledge, technological innovation and learning, to ensure that MERET continues to evolve, remains relevant and disseminates knowledge about the natural resources system to leverage the scale-up of activities; * and it has recently introduced a system of results-based management, moving away from simply monitoring outputs, to including training on measuring results and assessing outcomes for wereda experts and community management teams.   Sources: Nedessa, 2011, Nedessa & Wickrema, n.a. |

# Livelihoods

Despite several decades of intensive investments in RWM and natural resource management across Ethiopia, the impact on livelihoods and natural resources quality and quantity in many areas is rather disappointing. This should not distract, however, from the numerous sites across the Ethiopian Highlands where RWM and natural resource management has been more successful and is reported to have led to increasing household wellbeing, increasing community resilience and improved availability of a variety of natural resources (Nedessa & Wickrema, n.a.). Many land and water management technologies and approaches are not achieving their full impact, mainly because of low levels of ownership and sustainability, but also because where degradation of natural resources is less advanced, benefits of natural resource conservation are difficult to detect. Approaches to NRM and RWM have historically been technology-oriented and top-down in approach without much regard for the needs, aspirations, constraints and livelihood realities faced by farming communities. In addition, many of the NRM and RWM investments were seen as ends in themselves rather than means to achieve improved household wellbeing and increased community resilience (Merrey & Gebreselassie, 2010) (see sections on Planning and Implementation). It is of critical importance that RWM/NRM strategies adopt a people-centred approach which takes into account local livelihood strategies and constraints, cultural, social and institutional dynamics as well as power relations and gender issues. It is essential to gain an understanding of these aspects because they feed into development planning for sustainable land use and livelihoods. Farmers’ livelihood strategies shape their ability and desire to adopt different land-use practices. Therefore, an adequate understanding of these strategies is critical for appropriate targeting of interventions.

Across the three study sites there are some significant patterns and trends in relation to livelihood issues. In order to understand how these relate to livelihoods within the area and how this is linked to RWM/NRM issues it is useful to look at some site-specific examples.

## Diga

During the baseline research it was reported that there is a significant problem with termites within Diga woreda. Problems with termites were first reported in Mana Sibu woreda (250km west of Nekemte) during the 1960s. Experts report that the infestation is caused by declining soil fertility resulting from deforestation, degradation, overgrazing and other related factors. Due to the severity of these factors, the problem with termites has expanded to neighbouring areas around Nekemte, including Nedjo (woreda next to Mana Sibu), Gimbi, Diga, Guto wayu, and recently Sibu Sire. The aggressive expansion of termites has serious repercussions for local livelihoods including lack of suitable grass for livestock, nectar for beekeeping, reduced crop yields, and declining productivity of land. There are reports that termites are even posing a threat to newly built infrastructure; for example house damage was cited by farmers as a big problem and they have damaged a health station in Bikila kebele.

During focus group discussions participants were very concerned about the termite problem and wanted help to address the issue. There have been subsequent discussions about how to contribute to research on these issues, perhaps linking with ILRI project experience from Uganda. On the surface this may not immediately seem relevant to RWM/NRM issues but incidents of termite infestation in other African countries suggest that the problem may be an indicator of wider NR imbalances (Sileshi et. al. 2009). In many places termites form an integral and beneficial part of the agro-ecosystem; however, as humans encroach into bush land, conflict between humans and termites is increasing. NRM therefore potentially holds the key to the management of termites. There is also evidence to suggest that local knowledge can play a role in termite management. In Uganda night corralling of cattle is practiced; however this does not seem to be addressing the termite problem in Diga. There is a need for more research assessing corralling for soil fertility management and whether it can contribute to termite control. Detailed investigation of the termite problem in Diga is required, including how termites impact on natural resources and livelihoods. There is potential for developing a balanced management approach which acknowledges the role of termites in the local eco-system through combining the skills and indigenous technical knowledge of farmers with scientific knowledge. There is also scope for testing whether experience from other African countries is relevant and can be utilized effectively.

There are also issues within Diga woreda around forest management, particularly in areas where there are remnant forests such as in Bikila kebele. In these areas farmers report conflicting information about the extent of forest coverage and deforestation; some say that the forest is expanding but in other areas forest clearance is reported. There are also a variety of perceptions about the value of trees among farmers in this area. There is evidence that deforestation is occurring in order to reduce the habitat of baboons which present a significant threat to both crops and livestock. However, it is likely that the clearing of forests is exacerbating the baboon problem. Other farmers regard specific trees as being essential for coffee production, because of the shade they provide. Traditional religious beliefs also seem to play a role in forest conservation. At the moment only anecdotal evidence has been collected on these issues, more in-depth investigation is required. However, these examples illustrate how different experiences and perceptions influence human-environmental interactions. This is significant for policy development, for example the planning of tree planting interventions.

Land scarcity and landlessness have been mentioned during the baseline research as being an issue in Diga. Respondents suggested that the majority of households in the district do not have enough cultivable farmland, often as a result of declining land productivity. These problems seem to be worse in the highland kebeles. Low productivity of land is mainly due to soil degradation, including nutrient mining and erosion, termite problems, and declining fertility due to continuous farming. Landlessness represents a significant problem among the youth which in turn triggers alternative livelihood arrangements such as land renting, movement to the lowlands for paid labour (i.e. sand mining), or movement to the lowlands to clear forest land for farming. Low productivity in the highlands pushes people to the lowlands in search of fertile soils. Establishment of farms in lowland areas has a negative impact on the natural forest as farmers clear trees and bushes for cultivation. Increasing population in the lowlands has serious implications for the long term natural resource base of the area. It will be important to have a more in-depth understanding of land ownership within the woreda, as well as migration patterns and population dynamics and how this will influence planning and implementation strategies for RWM/NRM.

## Fogera

Rice production was introduced to Fogera during the Derg regime as a livelihood opportunity, but this has impacted on human-environment interactions. In the past the area was known for cattle production (the Fogera cattle breed is widely known in Ethiopia for its high quality and milk production), and local communities led a semi nomadic life with transhumance grazing patterns from uplands to the plains during the dry season and from the plains to the uplands during the rainy season. Crop production was limited. The introduction of rice led to a change in livelihood strategies, which has reportedly been beneficial in terms of income people can generate – there are now up to three cropping seasons with cash crops being produced during the dry season, but there are potential issues in terms of sustainability. Rice production is possible in Fogera due to the seasonal flooding of plain lands; initially flooding was considered to be beneficial due to the transfer of fertile topsoil, but in recent years, as a result of ongoing land degradation in the uplands increasingly exposing sandy sub-soils, the floods are bringing sand and less fertile soils and this is now negatively affecting crop production. This suggests wider issues of NR degradation/mismanagement and has implications for NRM strategies. Farmers compete for fertile land in the plains/wetland for rice cultivation, which leads to conflicts among farmers as farm boundaries are virtually invisible after months of flooding. There are also conservation issues as the wetland ecology is threatened by farmers competing to obtain land as the water retreats.

The baseline research has shown that in terms of increasing household income, the expansion of rice production is largely positive, but there have also been significant changes in livestock production as well as movement. Further analysis is required in finding a balance between expansion of rice production and livestock rearing. Although people have continued to keep livestock, previous patterns of livestock movement have been curtailed due to changing land use patterns. As a result, there is stress on existing grazing land and conflicts are common. Unrestricted grazing is frequently cited as a problem in Fogera but this requires further analysis, as the situation may have been exacerbated by outside interventions. For example, an IPMS (Improving Productivity and Market Success of Ethiopian Farmers) project piloted area enclosures in Kuhar Mikael kebele but this resulted in conflict between farmers over access to the enclosures. There are likely to be very different perceptions about grazing issues between community members and development agents, including local government, but also among community members, depending on how much they depend on communal grazing land. It will be important to understand these issues if there are to be successful interventions in this area. The conflict in Fogera over both grazing land and access to wetlands for rice production between local communities has significant implications for local level decision making about NRM and RWM activities, particularly those requiring collective action. Approaches need to be found which instigate a sense of ownership among community members over communal resources to ensure their sustainable management. There is therefore a need to talk about planning beyond the government line departments.

These dynamics could also represent opportunities in terms of RWM/NRM. There may be potential for mutually beneficial arrangements between those farmers in the uplands and those with land in the wetlands, taking into account upstream/downstream relationships which could be an incentive for farmers to undertake RWM activities. Fogera has a high potential for dairy but according to Woreda agricultural experts, due to the feed shortage, farmers from highland Kebeles move indiscriminate breeds to the plains during the dry season, which has resulted in the dilution of the better yielding Fogera breed in the plains. Forage development interventions in the highland areas could potentially be used to slow down runoff, increase water infiltration and help to stabilize gullies on grazing lands. This in turn would reduce the amount of sandy and infertile soils being transported to the wetlands. In the wetlands there is potential for improving crop residue use. At the moment farmers in Fogera bring rice to Woreta town to be processed (shelled) (22 processors in Woreta town) but they do not have access to the residue once rice is processed. Producers sell the crop residue as livestock feed, but farmers get no benefit. This seems an area where further research is needed on how best to share benefits and compensate farmers for the value of fodder – an area where policy support might be required. Farmers could be supported to establish cooperatives which could process rice and keep crop residues for their own use. All these potential interventions need to be assessed in terms of their ecological impacts, but also in terms of implications on labour for different households (in terms of wealth, size of household, location, etc.) or competition over land for alternative enterprises.

## Jeldu

Eucalyptus is a significant contributor to livelihoods in Jeldu as it represents a major source of income for a variety of people. Because income from eucalyptus can be up to 20 times higher than from staple crop (maize) production (Tilahun Amede, personal communication, 2010), eucalyptus plantations are spreading fast in the research site. There are reports, however, that there are related issues in terms of land and water use. In particular, eucalyptus production is leading to conflicts over land ownership. Some people rent land and plant eucalyptus as a way of securing access to land; they refuse to return land to the owner unless compensation is paid to them for the accumulated value of trees. In addition there are issues with absentee landholders (people who no longer live in the community but still own land) who plant eucalyptus on land that they rent or contract to local farmers. Problems are caused because they plant eucalyptus on productive farmland which affects neighbouring farmers who complain about negative effects in terms of ground water, shading of crops, and impacts on production. Farmers are also planting eucalyptus at the bottom of valleys where there are springs, but there are widespread complaints that this contributes to the drying of springs which are important local water sources. It is locally agreed that this needs to be prohibited but this will need to be discussed and agreed by local communities who would have to develop by-laws that regulate planting of trees near to streams. This could be an entry point for community led collective action and innovation.

The issue of eucalyptus is complex and there is often a polarization of views among experts, particularly in terms of the impact eucalyptus has on land and water resources. Some of these views trickle down to farmers and are often combined with local perceptions and agendas. Farmers in the area seem to see eucalyptus as both a threat and an opportunity. It is obviously an important source of income for those who rent their land; it is a valuable cash crop and provides income for landless young people who assist with harvesting, loading and unloading logs. However, a major issue seems to be the fact that there are no laws or regulations governing the planting of eucalyptus. In Jeldu local conflicts over this issue have been taken to the Region because the woreda cannot control the situation. In general, there is a need for further analysis and evidence-based research which looks into the different perceptions revolving around eucalyptus from both a livelihood and land management perspective.

Soil erosion is a significant problem in Jeldu area, particularly due to high rainfall at the beginning of the cropping season when soils are bare and exposed to rainfall impacts and run-off, especially in the upper parts of the woreda. This leads to a decrease in the amount of productive land available for farming. Farmers in the area used to practice fallowing, but this is decreasing because of scarcity of productive land. This corresponds to other changes taking place, for example there is significant out migration mainly by the young people towards the eastern part of Ethiopia (Adama, Arsi, etc.) in search of seasonal labour. More in-depth investigation of historical trends in migration and whether it has increased in recent years as well as in-depth assessment of push and pull factors would be useful.

Climatic changes were also mentioned as a major issue during the baseline research. Farmers reported changes in weather patterns as well as extreme seasonal fluctuations, i.e. flooding and drought. 2010 saw outbreaks of crop diseases, for example potato blight and yellow rust in wheat, attributed to changing weather patterns. Disease outbreaks led to low crop yields which led to food insecurity. This had major impacts, as many areas within Jeldu are already food insecure. 20 kebeles out of 38 were classified as food insecure in 2010 and received food aid. Increasing vulnerability and food insecurity is likely to influence decisions about livelihood strategies, particularly out-migration. It will be important to gain a more in-depth understanding of seasonal patterns and how this affects households. These issues will also be significant for planning NRM/RWM strategies because vulnerable households will be counted on for participation in food for work schemes, etc., but their availability may be affected by migration patterns.

Considering the problems with soil erosion and degradation in Jeldu, and the importance of eucalyptus for local livelihoods, trees could be an important focus for RWM/NRM activities. Bishaw (2001) argues that tree planting through agro-forestry and social forestry should be an integral part of rural development programs and the physical recovery of degraded land in the Ethiopian highlands. However, for this to be relevant for the NDBC, it will be important to consider a broad definition of RWM which recognizes the function of trees for conserving water within the landscape and for protecting watersheds. Integrating eucalyptus with other multi-purpose and locally suitable tree species could address a number of issues from soil conservation and fertility to water retention as well as cash crops and income generation (see Dessie and Erkossa, 2011). However, farmers have so far been unreceptive towards government-initiated tree planting activities due to lack of involvement (i.e. regarding location, species etc.). Local participation in NRM planning will be critical for any future efforts.

## Implications for RWM/NRM practices

Historically, top-down policy and planning practices have proven ineffective in dealing with questions relating to location-specific environmental conditions and sustainability of the livelihoods of local communities. Mequanent (1998) argues that degradation of environmental resources is most likely to happen when local communities are marginalized in the course of top-down oriented development initiatives and this is supported by evidence from historical NRM approaches in Ethiopia which have excluded communities from decision making processes, deprived them of a sense of ownership and made them prone to environmental neglect. Examples from the different sites highlight the importance of site specific contexts and the need to take seriously issues which communities view as significant, and to involve them in the process.

Evidence from the baseline research suggests the majority of local level NRM practices are currently farmer initiated at community/household level. A range of indigenous practices for land and water management are mentioned in the site reports. These include: side plowing, establishment of soil and stone bunds, planting, use of organic fertilizer such as animal manure, intercropping and crop rotations, and fallowing. There is also evidence across the sites of indigenous irrigation systems. These practices suggest that rural communities have much to contribute to RWM/NRM processes in terms of knowledge and innovation. It is increasingly recognised that indigenous knowledge comes from the cultural context of the people and that it evolves in contact with specific environmental conditions. Rural communities therefore have much to contribute to innovation processes. At the same time, one also has to acknowledge that on their own, often local NRM practices are no longer able to deal with accelerated levels of land and resource degradation and therefore need to be combined with more scientifically-based approaches, practices and technologies. Farmers are often experimenting with a variety of choices and negotiating between old and new ways of doing things, rejecting or select newly emerging options and incorporating them into daily life. ‘Farmer experimentation is the main means by which adaptations are made to the farming environment and ultimately the main mechanism through which indigenous natural resource management strategies remain sustainable in the face of change’ (Dixon, 2001: 53).

From the research sites there are a number of examples of community-to-community knowledge sharing and innovation. For example, in Diga, Harar re-settlers have introduced soil conservation practices like leaving maize and sorghum stalks on the field to avoid soil erosion during the dry season. Strip planting of vetiver grass has also been implemented at farm level in some areas, and has been used to delineate degraded areas for enclosure. These seem to be practiced by specific individuals in specific places. There needs to be more investigation about how these practices have been introduced and by whom and what farmers hope to achieve by adopting them. Local coping mechanisms have been developed including cultivating early maturing crop varieties in order to cope with unpredictable weather patterns. It seems that farmers are open to diversifying their crops and are adopting new varieties from research centres and neighbouring areas; this could be explored further. It would also be interesting to explore local coping strategies further because these are a form of local innovation, some of which may be currently unacknowledged or under-reported. Farmer-led innovation could play a role in improving traditional practices; however, fear of failure is often a major reason for lack of innovation as the consequences of failure are fully borne by the farmer. It will therefore be important to take potential risks and farmer fear of failure into account when considering new interventions.

Despite their knowledge and experience, farmers’ role in the research and planning process is minimal and their views are often overlooked. Lack of farmer awareness is something which is regularly mentioned by a range of stakeholders, particularly higher level technical stakeholders. Such widespread attitudes are not conducive to farmer participation or capacity building. Farmers often have good reasons for resisting certain interventions/strategies. For example, in Diga fallowing is common in the lowlands as mono-cropping and application of a range of chemicals by the state farms has increased acidity of the soil. Hence, farmers in the lowlands commonly practise fallowing to improve productivity of the soil. However, fallowing is not common in the midlands, partly because of land scarcity, but also influenced by the perception of the local administration considering any farmer with fallow land as lazy from whom land can be taken for redistribution. This is an example of why it is important to communicate local livelihood strategies to development planners – or even better to involve them in the analysis of livelihood strategies in the first place.

There is also some evidence about resistance to fertilizers: evidence from Diga suggests that certain areas are no longer responsive to the application of chemical fertilizer. A male participant said ‘we are not in a position to take chemical fertilizers because even after harvest, crop output cannot cover the costs of the fertilizer as land productivity has diminished’. The fact that land productivity is decreasing despite the use of chemical fertilizers is significant for RWM/NRM activities. Further research needs to be done on developing site-specific fertilizer recommendations combining organic and chemical inputs. Such site-specific approaches would also have to take into account markets and the often observed discrepancy between income generated from the sale of crops in contrast to excessively high costs of fertilisers. An integrated approach is required whereby land and water management are key ingredients for addressing land productivity in the longer term, while short term inputs, which often and over the longer term are not sustainable and do not give good returns, and therefore potentially putting a strain on limited resources, are used only during the transition period of moving towards a more sustainable land and water management system.

The existence of community institutions demonstrates that an alternative form of collective action is possible if initiated by community members themselves. A range of community institutions and organizations were identified during the research, including livestock lending mechanisms, reciprocal labour institutions, socio-cultural/traditional institutions such as *Idir* and *Equb*, church groups such as *Mahiber*, women’s groups and cooperatives. Other important traditional institutions include *Gada* (a generation-grading system) which exists in varying degrees in Oromo areas and traditional resource management representatives such as *Abba Laga* (meaning Father of the River(s)) which was mentioned in Diga). These institutions are often popular and well respected within the community and already play a role in social organization, resource mobilization and resource management so could be significant for RWM/NRM activities. ‘Institutions which command respect and support from the community are potentially important for natural resource management and should be supported and encouraged’ (Dixon, 2001: 27-28). Traditional religious beliefs, such as *Waaqefatta* (Oromo religion) and the Orthodox Church, have also been shown to play a role in natural resource management (cf. Keblessa, 2005; Alemayehu, 2007).

These institutions provide important local communication channels for spreading information among local actors. Utilization of these mechanisms in RWM/NRM activities presents a potential opportunity for innovation. However, there needs to be further analysis of what local institutions exist in a given area, if they could be linked to NRM, including planning, implementation and evaluation of RWM/NRM interventions and land use planning, and how they engage with NRM issues will be important. There is, however, a need for in-depth and critical examination of the roles played by these organizations, as in some cases, traditional and cultural values may prevent women and other social groups in society from participating. It is also necessary to remain critical about the concept of ‘community’ and recognize that communities are not monoliths, undifferentiated entities. They consist of categories of people distinguished by age, sex, interest and power. Nor do they exist in a political or economic vacuum; they are linked in various ways with the larger society that surrounds them (Murphree, 1994: 403).

There are also broader issues which need to be taken into account. For example, it has been observed that one of the blocks to community action on NRM issues in Ethiopia is that there is no clear legal base for determining ownership of common pool resources (Bishaw, 2001). There are instances of conflict across the study sites, both along ethnic lines, between local communities, and within communities among groups applying different livelihood strategies, which often materialize over natural resources, particularly common pool resources. For example, there is conflict over waterways and irrigation in Jeldu, conflict over grazing and access to wetlands for rice production in Fogera, and conflict over waterways between ethnic groups in Diga. This is significant for RWM/NRM activities and for managing group interactions.

## Conclusions related to livelihoods

Our research has highlighted various livelihood issues which need to be considered if RWM/NRM activities are to be successful. Key among these is active involvement of community members in the process of RWM/NRM activities right from the start. Commentators highlight that lack of interest in development activities on the part of community members can be a form of resistance to the imposition of external values and concepts by outsiders with a limited understanding of local realities (Cavalcanti, 2007). Development agendas and interventions introduced by outsiders may conflict with local knowledge and priorities which address specific needs and circumstances. Community perspectives should therefore be integrated with plans of action for long term sustainability. Better understanding of current knowledge and practices, coping mechanisms, capacity for innovation and mechanisms for community mobilisation, as well as understanding the reasons for resistance to certain interventions, could lead to a much better understand of how, where and what to promote when it comes to NRM.

There are potentially exciting opportunities for co-development of plans and interventions which incorporate local perspectives as well as develop farmers’ capacity to innovate. Care must be taken not to idealize indigenous knowledge, but multi-stakeholder participatory processes involving external agents and community members can be used to assist local communities to organize and assess their own knowledge and resources whilst also identifying and integrating appropriate outsider knowledge and technologies. Or, as Ludi (2004:387) wrote: ‘Not narrow disciplinary research is necessary for addressing land degradation and its impacts, but interdisciplinary communication and ***transdisciplinary collaboration***. This includes multi-disciplinary research, research partnerships between researchers and research organisations from Ethiopia and from abroad, and genuine collaboration of researchers and the concerned society. Not focusing on either participatory approaches or scientific methods alone, but combining the two knowledge systems equitably will be the key to finding options for sustainable land management and sustainable livelihoods’. However, it is also important to bear in mind that not everyone may want to share their knowledge. Many rural people, particularly in countries where political sensitivities are pervasive, rely on information flow based on secrecy, evasion and restraint (Davidson, 2010: 213). People may have good reasons for not wanting to make their perspectives and knowledge known or widely available. Consideration of the fact that people in rural areas work long and exhausting hours and have little time to carry out project tasks, particularly if they cannot see tangible benefits, is also crucial. If farmers already have to do compulsory work on resource conservation activities such as watershed protection or tree planting, as well as being required to attend political meetings, ‘sensitization’ sessions and trainings, they may not be willing to participate in additional planning events. This is particularly relevant if their experiences of 'participation' are already negative.

Therefore, it will be important to develop mechanisms for collaboration between various stakeholders which enable different knowledge and perspectives to be exchanged, shared and translated into action. As Teshale et al. (2001) highlight, ‘While devolving the responsibility for resource planning and management to local communities may be a necessary condition for meeting the objective of sustainable development, it is important – particularly in the case of developing countries – that this is complemented with capacity building initiatives at local and national levels in an integrated framework’ (2001: 34).

# Innovation

Our findings on planning and implementation processeshave indicated that a strongly linear development paradigm still dominates Ethiopian development thinking about NRM. Enhancement of NRM is viewed as being amenable to introduction of research-generated technologies at kebele level. Participatory approaches to rural development, as advocated by Robert Chambers (1983) and others, do not appear to have significantly influenced the implementation of NRM policy in Ethiopia. Furthermore, more recent thinking on the application of innovation systems thinking to NRM development appears largely absent. In this section we consider recent ideas on how change happens in rural settings, drawing on innovation systems thinking. We also make some suggestions on how these ideas could be implemented to improve RWM approaches in Ethiopia.

## Definitions

There are many different understandings of innovation, innovation systems and innovation capacity and it will help our diagnosis of planning and implementation of NRM/RWM – particularly as we advocate for a much stronger recognition of ongoing farmer innovation and requirement for innovation instead of technology dissemination in this field - to present our own understanding of what these terms mean:

**Innovation** for our purposes is defined as the “process of producing, accessing, diffusing and, most importantly, putting into use knowledge in socio-economically useful ways” (after Hall et al, p.12, emphasis added). Innovations may be technological, organizational, institutional, managerial, related to service delivery or to policy. Knowledge or technology does not become an innovation unless it is used. The term innovation is often used interchangeably with “technical intervention” but mistakenly so in our understanding. Innovation is about much more than technologies. Indeed those innovations which lead to changes in rural livelihoods are often organizational in nature; things like sorting out input supply arrangements for crop production, or improving connections between small-holders and markets for their produce.

An **innovation system** is the cluster of individuals and organizations involved in knowledge generation, diffusion and use (researchers, farmers, private sector firms, universities, extension agents, technical experts from line ministries, and so on) together with the processes required to turn knowledge into useful economic or social benefits (including trading arrangements, credit supply systems, input supply, processing and others). Conventionally, consideration of an agricultural innovation system has tended to focus on a specific value chain and the actors and processes involved in bringing products from production to consumer. In the context of RWM/NRM, the value chain emphasis may be less useful. Here, innovations are focused on long-term livelihood and environmental benefits and the role of the market as an incentive for change is less prominent. Incentives for innovation are likely to be less market-driven, less individualistic and more difficult to achieve than when considering a value chain-based innovation system.

A related concept is that of **innovation capacity**. This is essentially the capacity of an innovation system to bring about beneficial change. Just what this means in practice is difficult to pin down, but the four element framework for conceptualizing innovation systems proposed by the World Bank is useful (World Bank, 2006). The first element is the actors involved: who is present and who is missing? Is there a diversity of actors? Is the private sector or civil society strong or weak? Do actors have an awareness that the current situation needs to be changed? Are actors in a position to change the situation, i.e. do they have the agency to initiate innovation and change? Secondly, what is the nature of the linkages between actors? Are different types of actors well-connected to allow joint action and a free flow of knowledge? Thirdly, how do actors behave? Are there entrenched ways of working for particular actors that inhibit interaction or the possibility of innovation? Finally, is the enabling environment conducive to innovation? Are there policies or infrastructural issues which make innovation difficult? Each of these elements contributes to a healthy and well-functioning innovation system. We would argue that in general, systems which favour innovation are those where there is a diversity of actors who are well linked, are not hampered by cumbersome institutions or bureaucratic hurdles, and who operate in an environment that encourages change. Those in which innovation is less likely to happen are characterized by dominance of the actor landscape by one sector, a lack of a networking culture, entrenched habits and practices that do not allow change, and an external environment that makes change difficult (e.g. unforeseen effects of existing policy).

## Innovation capacity and RWM

In this section, we draw evidence from research reports from each of our research sites to characterize local innovation capacity and what might be done to enhance it.

First, we consider actors and linkages. Public sector dominance is a core characteristic of rural innovation systems in Ethiopia (Spielman et al., 2010) and this came through strongly in the research findings. Responses to questions about the key actors involved in RWM almost exclusively cited woreda officials, development agents and farmers as the core actors. Civil society actors were hardly mentioned and even research actors did not feature except perhaps in Fogera. The private sector was completely absent. To some extent this lack of diversity among actors may reflect the NRM focus of the study. We would not expect private sector actors to be engaged in NRM at this stage of development, as NRM is considered to be basically a public good. In a more commercially–oriented system we could expect input suppliers for irrigation or water harvesting equipment, seed suppliers for forages for bunds and so on. The lack of civil society actors contrasts with other situations, for example, in India, where numerous indigenous NGOs are involved in promoting environmental issues and where the Panchayat (local community institutions) would have featured strongly.

Turning to actor linkages, researchers asked questions about which existing networks are present at local level. Fogera stood out in this respect and a number of local networks were mentioned. These included Farmer-Research-Extension Groups (FREGs), Agriculture and Rural Development Partners Linkage Advisory Council (ARDPLAC) and Subject Matter Specialist Groups. Taking FREGs as an example, this form of network seems to have been reasonably active in Amhara Region; 33 FREGs were established in 4 zones of the Region. However, the groups are led by the Amhara Regional Agricultural Research Institute and therefore could be viewed as a technology dissemination mechanism rather than a forum for joint identification of issues, co-development of solutions and creating the capacity among farmers to choose from a range of options, as originally envisaged. Indeed, each FREG seems to be focused on a particular technology which is presumably determined by researchers rather than emerging from dialogue among researchers, extension agents and farmers. The linear development paradigm underlying FREGs also seems prominent in the ARDPLAC, although some evolution in thinking is apparent. ARDPLAC is the most recent incarnation of a series of government-initiated networks. Prior to ARDPLAC there were two other small-scale platforms that led to the emergence of the current region-level platform. The Research-Extension Liaison Committee (RELC) was established in 1986, and was replaced in the late 1990s by the Research-Extension-Farmers Linkage Advisory Council (REFLAC) with the inclusion of farmers as members (Demekech et al, 2010). REFLAC was organized at national, regional and research centre levels, and functioned for approximately 10 years before it was replaced by ARDPLAC in 2008. The evolution in naming and change in the composition of stakeholders of these networks does seem to indicate an acknowledgement that innovation requires more than dialogue between researchers, extension workers and farmers.

Currently, ARDPLAC members are drawn from agricultural extension service providers, researchers, administrators, universities, seed enterprises, mass media consumers, cooperatives, farmers, non-governmental organizations, credit and saving institutions, input suppliers, credit suppliers, and private companies (Demekech et al. 2010) and this broadening of membership composition is a welcome move. However, none of the respondents in Fogera were aware of the existence of ARDPLAC which indicates, that although the structures for dialogue are in place, impact at grass-root level still has some way to go.

As well as the formal networks established to enhance knowledge flow at local level, our research identified development agents as key nodes with a potential for connecting farmers to other important actors within the local innovation system. Development agents act as potential bridges between farmers and other actors but we identified some key problems with the way in which DAs currently operate (see Box 4). One constraint mentioned repeatedly was the uni-directional nature of influence of DAs. DAs are expected to take knowledge from experts and other higher level technical officials and transfer this to farmers. A frequent complaint was the information and knowledge flow in the other direction, i.e. from farmers to woreda officials, rarely happened. Farmers seemed disillusioned that their views never found their way into higher level discussions. DAs also felt that they were not listened to in the planning process and this led to demotivation which was in turn passed to farmers.

DAs occupy a critical position in the local innovation system and some attention to empowering them and giving them a stronger role in communicating farmer views at higher level could pay dividends. A further issue related to DAs was their lack of training which undermined their influence with farmers. In most cases DAs are young, have undergone a very technical TVET training with limited practical experience and have not had opportunities for continuing professional development or exposure to other sites and experiences. This led to some farmer respondents describing them as “farmers’ labourers”, indicating a lack of credibility regarding their advisory role. DA performance is largely measured in achievement of quotas they have to fulfill at Kebele level and which are passed down from woreda level, so the emphasis of their work is on achieving these quotas and much less on supporting farmers in learning and innovation or in carrying out tasks so that they are sustainable over the longer term.

The DAs’ role, in theory, is principally one of supporting farmers to improve their livelihoods through improving agricultural and NRM practices. In reality, however, as was reported by a number of respondents in our research, DAs are increasingly used for administrative purposes. This is undermining their credibility as providers of impartial and non-partisan information and knowledge. The role of DAs needs some serious thought. Their role is partly defined by the predominant “technology dissemination” paradigm based on deeply entrenched and strict hierarchies and clear sector boundaries prevailing in rural development thinking in Ethiopia. A rethink of their role could involve redefining their role to one of “rural facilitators”. The term “development agent” is rooted in the modernizing paradigm prevalent in Ethiopian development thinking. There are alternative models, whereby rural extension works are seen much more as facilitators - in some francophone countries, extension agents are referred to as “*animateurs*” and this would seem to us to be a more useful function.

A third contributor to innovation capacity is what we term “institutions”. In this context we define institutions as the habits and practices of actors and the rules and norms by which they operate. This was a difficult concept even for researchers to internalize. Their interpretation of “institutions” related to traditional community organizations and the responses to these questions were of limited value. However, from responses to other questions and lines of enquiry we can identify a number of institutions which may be hindering innovation in the study sites and in Ethiopia generally. Foremost is the system of quotas handed down from Regional and Zonal level for NRM interventions (see planning and implementation section). Quotas arise from the very top level through national plans such as PASDEP and currently the Growth and Transformation Plan. National targets for NRM are spread across woredas and officials are responsible for meeting their quotas. The need to fulfil quotas for specific interventions removes decision making about NRM strategies from farming communities, erodes ownership of implemented interventions and thus undermines their usefulness and sustainability. The quota system is open to abuse and fabrication and breeds mistrust and disillusionment among those involved in its working (see section on planning and implementation). It is furthermore focusing on outputs rather than outcomes or impacts. All this tends to inhibit innovation.

A related institutional barrier to innovation relates to the top-down nature of the NRM implementation process. For example, in Diga, as respondents stated: “farmers are often told to rehabilitate a degraded hillside or gully through campaigns that are supervised and overseen by government bodies”. Despite the rhetoric of participation, the power balance favours officialdom and very little decision-making power is left in the hands of communities.

Further institutions limiting innovation mentioned in the reports were the lack of women’s involvement in planning and implementation processes. Also, the numerous religious holidays were mentioned as limiting the efficiency of any planned interventions. Perceived “lack of farmer capacity” in relation to NRM interventions was also a recurring theme in responses from officials. This attitude of officials towards farmers has long been present; for example, kebeles used to be referred to as “peasant associations”. This view of farmers as peasants - backward, uneducated and unaware of problems and possible solutions (it has often been mentioned, even by farmers themselves, who have incorporated this narrative, that “they lacked awareness about the seriousness of resource degradation”) and thus requiring someone who tells them what to do - has undermined agency among farmers to deal with their own problems and this must represent a major institutional barrier to innovation.

The final element of innovation capacity is the enabling environment. In other words, are there policy or other external factors which make change unlikely? The predominant response to questions about external factors limiting innovation concerned limited resources. Many respondents, in particular DAs and woreda experts, indicated that lack of transport, office facilities, finance and so on were a major impediment to carrying out their roles effectively. Road infrastructure was also mentioned as a key constraint. For example, in Fogera “There are fewer roads to link one kebele from another and the WoARD does not have vehicles to transport people and goods from place to place. These are factors that limit NRM activities in the district”. Other factors mentioned were the quota system and inadequate budget allocation for NRM activities. Conflicts over NRM issues were also apparent in our research findings. For example, in Fogera, conflicts over grazing rights have created tension within farming communities and these issues would need to be resolved for any effective collective action to occur (see section 6 on livelihoods).

## Conclusions on innovation aspects

It is clear that there are some fairly entrenched issues limiting innovation at local level. Chief among these would seem to be the system of quotas for NRM/RWM activities and the top-down approach inherent in planning and implementing NRM activities to meet quota targets. There have certainly been moves to introduce more participatory approaches to NRM in recent years but “old habits die hard” and the evidence from our survey suggests that often participatory planning and implementation of NRM interventions is participatory in name only. Addressing this core issue could do much to free up communities and supporting actors to engage in more effective and sustainable NRM. An equally important issue concerns the prevailing understanding of how innovation happens. Evidence from our research suggests that a strongly linear paradigm still dominates thinking on rural innovation in Ethiopia: sector specialists and experts identify problems, which are then researched by Research Centres and Universities, who are responsible for developing solutions. These are then disseminated to farmers for adoption via the extension system. Innovation networks that have been established are based on the premise that the key constraint to innovation is poor knowledge dissemination and therefore if knowledge on technologies can be effectively passed from research through extension to farmers then beneficial change will happen. We would argue that more recent thinking on innovation networks acknowledging the need for a wider array of actors and more opportunity for multi-directional feedback and experimentation has much to offer in enhancing innovation capacity at local level.

In practical terms this could mean experimenting with the use of local innovation platforms to provide a space for relevant actors jointly identify constraints and solutions to NRM issues at local level (Nederlof et al, 2012). The use of innovation platforms has more recently been applied to development of commodity value chains but there is scope for their application in dealing with NRM issues.

# Conclusions

This baseline study has revealed a number of reasons why current RWM strategies are not as effective as they could be. National targets for improved RWM indicate that priority is attached to reducing natural resource degradation and its damaging effects on livelihoods and food security by government. This could be a force to help drive local action. However, targets are currently allocated down to kebeles with little attention to the suitability of each strategy for local agro-ecological conditions or their relevance to local livelihoods. This results in a lack of ownership by both farmers, who are ultimately responsible for implementing plans, and DAs who feel they have no influence over plans in spite of their local knowledge and despite being responsible for a notional bottom-up planning process. There are reasons why experts from the Ministry of Agriculture decide that specific RWM or NRM interventions are necessary, reasons which might not be immediately apparent to farmers, such as avoiding off-site costs or investing in ‘preventive’ measures rather than just ’curative’ ones. Insufficient communication and provision of explanations for such decisions contribute to a lack of buy-in and acceptance by farmers. It is therefore common for NRM interventions to be poorly implemented and maintained, or even destroyed, and for them to contribute little to improving local livelihoods. This lack of sustainability is also related to the way in which DA performance targets are set (these focus on implementation targets, not outcomes or longevity of interventions) and to the absence of effective governance arrangements for managing NRM on common lands.

As well as resulting in poor progress in terms of tackling natural resource degradation and improving land and water productivity, the current approach misses opportunities to support, and build on, local capacity for innovation. The entrenched mindset is that farmers lack awareness, have little knowledge to contribute, and must receive expert technical instruction from above. There is, of course, a place for external technical expertise, and research into new technologies by, for example, agricultural research centres. However these need to be married with farmer knowledge and experience in a freer, and more equal, exchange of ideas if real innovations are to emerge which can solve problems at local level. It has been shown how current institutional arrangements and incentives constrain such innovation, so any strategy must include the opening up of some space to tackle institutional constraints. There could also be opportunities to capitalize on existing local institutions which currently have little role in RWM. To ensure RWM is effective at a landscape scale, local strategies need to be integrated at higher levels to take account of downstream impacts. At its simplest this means that neighbouring kebeles and woredas need to come together to ensure that plans are complementary; such a process would need to be guided and supported by the zone or region, with the involvement of river basin organizations where these exist, and some rules would need to be agreed for resolution of any conflicts between plans. Finally, existing sectoral barriers need to be overcome to make most of RWM interventions.

## Ways forward

The following recommendations together represent an approach to improving RWM in rural Ethiopia in which impact, sustainability and local ownership of interventions are prioritised, and strategies are based upon meaningful participation of farmers (and other stakeholders), a growing base of evidence about what works and why, and increasing opportunity for true innovation at all levels. Although such processes are not always straightforward, and this does represent a major shift away from current practice, some of the foundations of this approach are in fact already present on paper, for example in existing policies and implementation guidelines (such as the emphasis on participation in planning as described in the MoARD’s Guidelines for Community-based Participatory Watershed Development – Desta et al., 2005). These provide some basis to take action.

### Shift the focus of targets from outputs to outcomes

Having national targets that help guide the development process in itself is not necessarily problematic, but the way in which targets are applied at local level is currently a major constraint to more effective RWM. Simply dividing a national target up among the different administrative units at lower level does not provide enough space to take account of social and ecological contexts, upstream-downstream effects or the synergies which occur across sectors. A more nuanced approach is required, with targets serving as guidelines to formulate outcomes that woredas and kebeles wish to achieve, and promoting consideration of inter-kebele and inter-woreda effects. This implies that a shift in focus is required away from outputs – e.g. how many hectares of land are rehabilitated or treated with SWC – to outcomes – e.g. the role these NRM/RWM investments play in achieving higher-level goals such as enhancing land and water productivity, improving food security or reversing environmental degradation. It is interesting to note that in some of the highly degraded areas of the Ethiopian highlands, in particular in Tigray and northern Wello, achieving targets for natural resource conservation in the past has been less problematic than it seems to be in our research sites. One reason could be that the contribution to household wellbeing and community resilience of RWM interventions in these areas is more favourable than in our research sites. One could hypothesise, for example, that rainwater management investments in an area with low and highly variable rainfall as characteristic for Tigray and Wello, is economically more viable than in high-rainfall areas such as Diga, Jeldu or Fogera.

There are good reasons for government to provide guidance for investments in specific areas which might not be prioritised and identified in needs assessments by farmers, particularly those concerning common pool resources. An example is the conservation of degraded hillsides used as communal grazing land, where NRM can be considered a public good. In such situations it is of paramount importance that government representatives and experts explain to farming communities why NRM interventions are required and help identify benefits that could be generated from such areas that could compensate at least partially for the investment costs or foregone benefits. Increasingly, the government should, in collaboration with development partners, investigate opportunities for Payment for Ecosystem Services (PES) to compensate farmers for investments where benefits accruing to society at large – or even to future generations – but not to those who have to bear the costs of the investments.

### Enhance monitoring and evidence collection on RWM with a focus on impact and sustainability

currently, insufficient attention is paid to monitoring the effectiveness of RWM interventions and practices, both in terms of their contribution to reducing natural resource degradation and enhancing productivity, as well as their use and sustainability.y. Without such basic learning about what works and what does not work there is very little opportunity to improve the effectiveness of RWM investments. Better monitoring information should be collected and both used to inform local planning and implementation, and fed up to higher levels in a learning process. This would require that the performance assessment of DAs as well as kebele and woreda officials demands that they carry out monitoring, but raising awareness about the importance of learning and evidence is likely to be at least as important. Agricultural research centres and universities could also be engaged in these research and learning processes.

### Revitalise and capitalise on the DA system

DAs are crucial interlocutors between farmers and sector specialists at Woreda level. The presence of dedicated DAs at local level across the country represents a significant opportunity for implementing new approaches to RWM based on a combined approach of scientific knowledge and farmer participation and local innovation. However the effectiveness of the DA system is currently limited by low technical capacity and personal motivation of many DAs, the instrumental use of the system for one-way transmission of information with little opportunity for upward learning, and the diversion of DAs into administrative and even political activities. These constraints must be addressed through: (a) provision of more practical training and experience-sharing opportunities for DAs; (b) clear definition of the roles and responsibilities of DAs to focus on technical support and facilitation of collective action rather than political mobilisation of farmers; and (c) adequate remuneration, housing and other benefits to ensure good motivation.

### Pay attention to local institutions

It is vital that those involved in trying to strengthen NRM/RWM recognise that this is not simply a technical issue but that institutions play a key role in defining whether or not RWM interventions are sustainable and effective. Paying greater attention to institutions will also enhance the chance of ownership of investments. An area of common conflict relates to changes to grazing land management. From a conservation perspective, closing off degraded hillsides and preventing grazing might well be justified, but if not embedded in local institutions which can design means by which to compensate for the loss of grazing area, the chance that rules are adhered to are limited. If, however, an agreement can be reached on how to use such areas, and by whom, there is an increased likelihood that grazing restrictions will be respected. Other local institutions, rules and regulations might also be available that would support the implementation of RWM.

### Move towards more meaningful participation

A paradigm shift is required in terms of participation and how local people are perceived and treated. Development actors will have to learn to trust people in new ways, to see their role as supporting people’s own life ‘projects’ and innovative capacity rather than trying to determine how people should use the assets, information and opportunities they have. Currently, “participation” is often seen as nothing more than organising a village meeting to hear the ‘community’s’ priorities and thereafter to mobilise community labour to carry out pre-defined activities. A number of assumptions are being made that need revisiting: that a ‘community’ as such exists with a single voice; that all people are able to express themselves at such events in spite of local power dynamics; and that people taking part are voicing their real concerns rather than what they know experts are expecting them to say; and finally that real understanding of people’s values, needs and struggles can be understood through such a limited process. Truly understanding the constraints different people face, and in particular why they may or may not choose to invest in RWM, requires much more intensive engagement.

### Open lines of communication to foster innovation capacity

As well as opening up planning processes to more meaningful engagement of farmers there is a need to diversify lines of communication and knowledge sharing in order to capitalise on the knowledge of all stakeholders and identifyinnovations to strengthen RWM. The current model whereby experts in research organisations or government generate knowledge which is disseminated to farmers is not sufficient to develop innovative locally-appropriate solutions which take into account local conditions, institutions and incentives. These institutions will no doubt continue to play an important role, but other sources of knowledge and action including farmers, DAs and formal and informal local institutions need to be recognised and incorporated to ensure that RWM strategies will be truly sustainable and address real livelihood needs. By establishing innovation platforms, these types of knowledge can be brought together and discussed among stakeholders to generate and test innovative new approaches to RWM that respond to specific local problems and needs.

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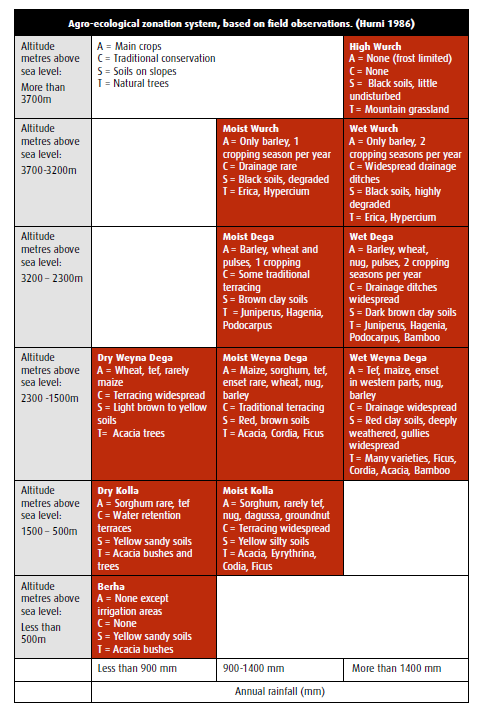
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Annex 1: Traditional agro-ecological zonation system in Ethiopia



1. <http://waterandfood.org/basins/nile/> [↑](#footnote-ref-1)
2. http://waterandfood.org [↑](#footnote-ref-2)
3. The terms ‘highland’ and ‘lowland’ are relative (and relative to each other) and do not denote specific altitudinal zones. [↑](#footnote-ref-3)
4. Full title: Nile Project 2: On integrated rainwater management strategies – technologies, institutions and policies [↑](#footnote-ref-4)
5. It is interesting to note that in other areas of the Ethiopian Highlands, in particular in Tigray and northern Wello, targets for natural resource conservation seem to be more readily achieved than in our research site and that Kebeles are even able to mobilise farmers to allocate time on their own for natural resources conservation. One hypothesis is that because degradation of natural resources and vulnerability of the landscape to low and irregular rainfall is higher than in most of our study sites, investments in natural resource conservation pay off earlier. In contrast to the NBDC research sites, Tigray and parts of Wello are characterised by high levels of degradation of natural resources and low and highly variable rainfall. RWM interventions might therefore contribute more to household wellbeing and community resilience, and investing scarce resources in RWM might be seen as a more viable investment than in less degraded and more rainfall secure areas. [↑](#footnote-ref-5)